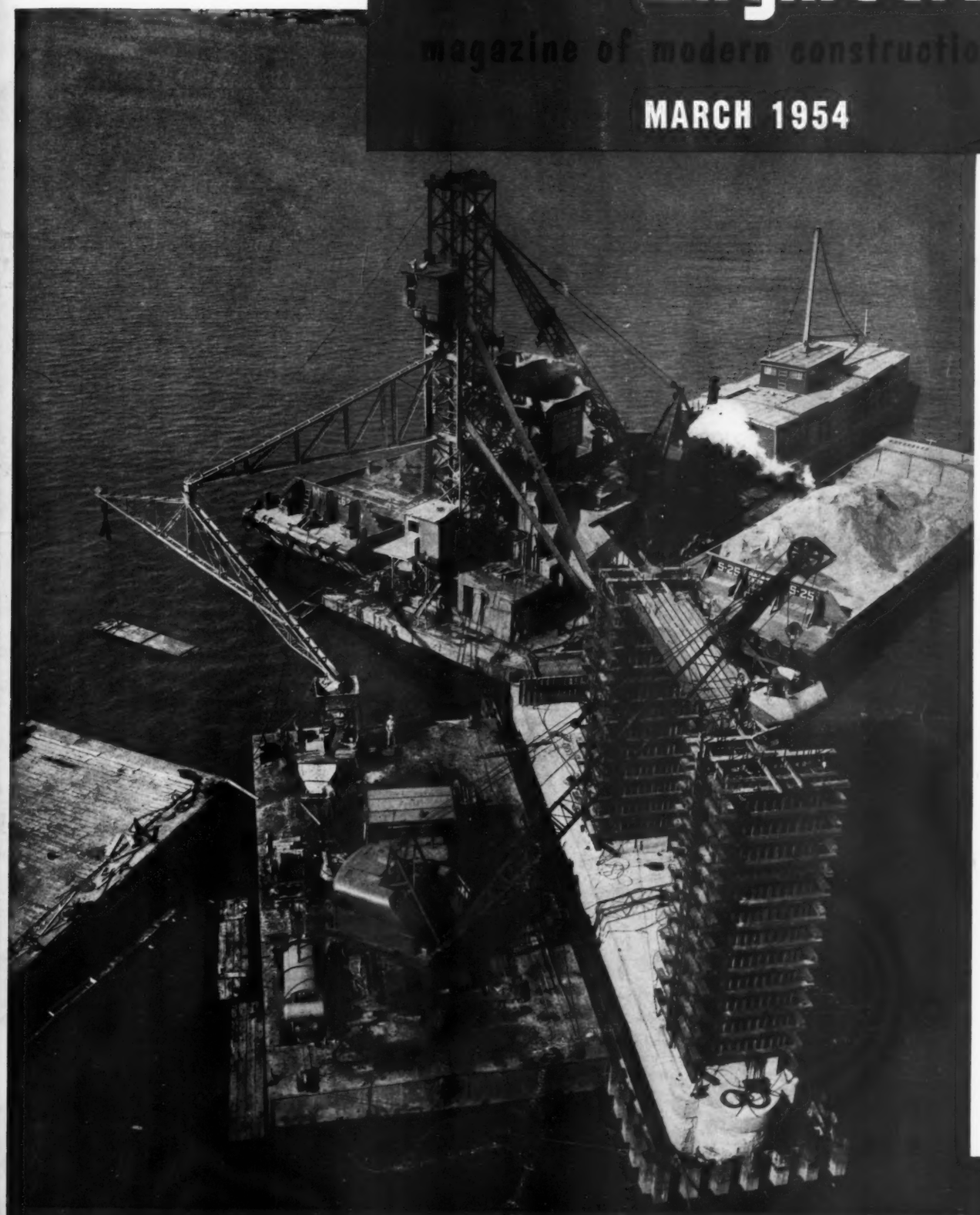
620

Contractors and Engineers

magazine of modern construction

MARCH 1954



Pouring pier shafts for the Raritan River bridge on the Garden State Parkway in New Jersey. Concrete is chuted from the mixing plant to a hopper, then fills the skip buckets. An Ingersoll crane swings the buckets to the forms. Parsons, Brinckerhoff, Quade & Douglas, Inc., of New York City is the engineer.

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An important bridge needed a new pavement

Washington Bridge at Providence, R. I., serves heavy traffic of U. S. Routes 1A, 6 and 44. Now paved with resilient Texaco Sheet Asphalt. Car track area was removed and repaved later.

Rhode Island replaces old granite blocks with heavy-duty Asphalt pavement

Washington Bridge at Providence, R. I., is a link in one of the main routes from New York City to Boston and Cape Cod. Traffic on the bridge runs as high as 41,000 vehicles a day, with trucks and buses representing about one-fifth of the total.

Last year, the State Department of Public Works decided to remove the old granite block pavement from the bridge, together with the car tracks. Now serving this heavy traffic is a resilient, heavy-duty Texaco Asphalt pavement, constructed in three courses, with a combined thickness of 4½ inches.

The wearing surface of the new pavement is dense, durable, skid-resistant Sheet Asphalt. Scientifically graded sand and a 60-70 penetration Texaco Asphalt were plant-mixed and laid to a thickness of 1½ inches to provide this surface. Rhode Island is well acquainted with the ability of Texaco Sheet Asphalt to absorb punishing impact, as a result of the performance of this type of pavement under some of the state's heaviest traffic.

From Rhode Island to the Rockies, road builders have paved with Texaco asphalt products for over half a century. The first step toward insuring the uniformly high quality of these Asphalt Cements, Cut-back Asphalts and Slow-Curing Asphaltic Oils is the scientific selection of the crudes from which they are refined. Throughout the refining process, these products are tested and retested to make certain they comply with the specifications in every respect.

Helpful information on all types of asphalt road and street construction is supplied in two booklets, which our nearest office will be glad to send you.

Removing old blocks and car tracks, preparatory to constructing three-course Texaco Asphalt pavement. Contractor: Narragansett Improvement Company, Providence.

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TEXACO ASPHALT

Contractors and Engineers

magazine of modern construction

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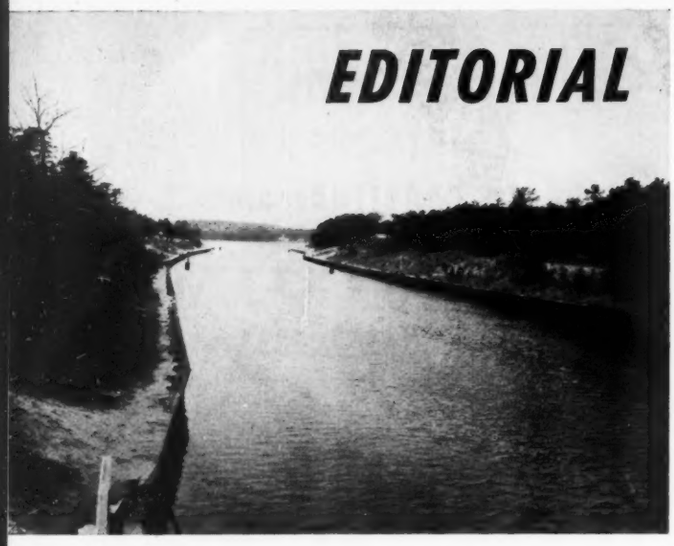
EDITORIAL



Now Let's Complete The East Coast Waterway

It has always seemed odd that a 120-mile section of the east coast Inland Waterway belonged to New Jersey, while the rest of the thousand-mile sheltered water route stretching along the Atlantic seaboard was the property of the Federal government. This state of affairs no longer exists, since the state of New Jersey recently transferred title of this coastal strip to the U. S. Army, Corps of Engineers. The inland channel that changed hands extends from Cold Spring Harbor at Cape May, the extreme southern tip of New Jersey, northward along the coast for 120 miles to Manasquan Inlet, where the Manasquan River meets the Atlantic.

This change looks like a wise move. The Army Engineers are in the best position to maintain this channel properly and in keeping with all the other waterways under their jurisdiction. The Corps is already planning to dredge the New Jersey channel to a depth of 12 feet. In places the water route has filled in and shoaled over so that vessels drawing more than 4½ feet of water get in trouble. No money was involved in the deal, but the state of New Jersey is relieved of some $200,000 in annual maintenance costs which can be used to better advantage in developing some of the tributaries of this waterway.

Now is as good a time as any for the Federal government to consider extending the water route northward, from its present terminus at Manasquan, to Sandy Hook and New York harbor. However, this 20-mile stretch of coastline, unlike the existing 120 miles of waterway along the New Jersey coast, has no conveniently located offshore reef to provide a natural and sheltered inland route. The extension would have to be a canal.

No great engineering or construction problems should be encountered in excavating such a canal. However, right-of-way costs would probably come high, since the route would have to pass close to popular ocean resort cities like Asbury Park and Long Branch. Bridge building would also be a big item since this northern coastal area is heavily interlaced with highways.

But the advantage of having an all-weather protected water route, connecting practically every major harbor on the east coast, is an asset that should not be overlooked. Boats now using the Inland Waterway must venture into the Atlantic Ocean to make the run between New York harbor and Manasquan, while from Boston to New York they sail the sheltered waters of bays, Cape Cod Canal, and Long Island Sound. If this remaining short stretch is bisected by a canal, the Inland Waterway will be complete from New England to Florida. In our preoccupation with highways, air, and rail transportation, we cannot afford to neglect water transportation — the cheapest of them all. It's time to close the gap in New Jersey.

News and Views

Highway construction may reach even greater heights in 1954 than had been anticipated, providing Congress accedes to President Eisenhower's request that the 2-cent Federal gasoline tax not be cut to 1½ cents on April 1. The President hopes to use the entire annual revenue of **$900 million for the highway aid program.** His proposal—which would virtually double present grants—is practically an endorsement of a bill, already introduced, which would authorize outlays of more than $800 million a year for road building.

Even as Congress considers the question this month, highway work is moving toward **new levels in construction and award volume.** Toll-road work should increase late this year.

The mushrooming growth of toll roads has also created **new problems for turnpike authorities.** Now, they are focusing their attention on two important questions—how to keep the roads out of Federal hands, and how to coordinate policies so that toll road regulations will be kept uniform in the various states.

Like toll roads, another trend gathering momentum over the past decade has been the **increasing use of precast concrete** for major structures. More than 300 contractors used this type of construction last year as compared to the much smaller number of pioneers doing the work a scant eight years ago. Just now, studies by the American Society of Civil Engineers and the American Concrete Institute are expected to result in a **code of standards** for precast concrete construction.

Another new development in dam construction may be in sight if the Aluminum Company of America goes through with its planned construction of **hydroelectric power dams** in the northwest. With $13 million invested in plant facilities, the company is concerned about its inability to get long-term arrangements for power and is mulling over the possibility of building dams that will provide energy for aluminum production.

Heading the Construction Industry Manufacturers Association for 1954 are Frederick Salditt, Harnischfeger Corp., president; Gail E. Spain, Caterpillar Tractor Co., first vice president; Kenneth Lindsay, Iowa Mfg. Co., second vice president; and I. W. Lloyd, The Ohio Oil Co., secretary-treasurer.

The steam-operated Bucyrus-Erie floating derrick lies idle hugging the shore as rough waters call a temporary halt to the pile-driving.

A closeup of a completed section of the seawall. The high side, facing the lake, is 13½ feet taller than the shore side. *C&E Staff Photos*

Sheet-Pile Seawall Safeguards Highways

Sand-filled steel cells form barrier to protect Cleveland's new shore-front route from Lake Erie

ONE OF THE BIGGEST projects now under way by the Ohio Department of Highways is the closing of a 3½-mile gap in Cleveland's lake-front superhighway. When the $10,000,000 worth of construction is completed this year, six lanes of uninterrupted divided highway will run adjacent to most of the metropolitan area just off the fringes of Lake Erie.

Among the larger contracts completed in 1953 was the contruction of a filled steel sheet-pile seawall to provide protection for a section of the new highway built on a filled-in base adjacent to Lake Erie. The Great Lakes Dredge & Dock Co., Cleveland, was awarded this contract on its low bid of $1,976,640. Work began in May and was completed at the end of 1953.

Seawall

The seawall consists primarily of 30-foot-diameter sheet-pile cells connected by arc segments of 10.24-foot radii. Each cell is made up of 72 pieces of MP 112 piles, and each segment has 22 pieces.

The wall begins just off the E. Memorial Shoreway near E. 70th St. and runs west, parallel to the shore for 750 feet. Then it makes an almost-90-degree turn out into the lake, for 800 feet, to the pier-head line. From this point, it again runs parallel to the shore for 2,000 feet and then bends back toward shore for 300 feet.

Part of the area enclosed by the seawall is to be filled in with sand, and the rest will be used as a mooring basin at a later date.

The Great Lakes Dredge & Dock Co. brought in a steam-operated Bucyrus-Erie floating derrick and began by driving sheets on the east end of the seawall. Four wood piles were first driven and capped inside the area of the beginning cell, and a circular template made of 12x12 timbers and 4x12 planking was set on top. The 60-foot-long sheets were then closed around the template and driven three at a time with a Vulcan 50C hammer. A special steel bonnet was used to drive the three piles.

Driving Succeeding Cells

After the first cell was driven, the template for the segments, which was suspended from a steel frame that cantilevered out from the cell,

(*Concluded on next page*)

PERFORMANCE PAYS OFF!

THE tires you buy or specify can help keep you ahead of schedule—or drop you into a mess of dead equipment, idle men and busy red ink.

Goodyears are the best workers—the longest wearers—the tires *specifically designed* to thrive on your kind of jobs—to give you lower costs per hour.

It takes worlds of experience to build such tires—and Goodyear has it. Goodyear has built more tires for more specific purposes than anyone else on earth. So when you buy or specify Goodyears, you're buying the tires that can put more money in your pockets. Goodyear, Truck Tire Department, Akron 16, Ohio.

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for stamina and full pull, forward or reverse, on all kinds of tire-killing work.

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GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

(Continued from preceding page)

was set in place next to the cell. Piles were driven as before. For the second cell, the circular template, which had been set on pile bents in the beginning, was simply floated into place and anchored to the segment.

As cells were completed, they were filled with sand by two self-unloading sand-suckers, each having a capacity of about 1,000 cubic yards. The sand-sucker crews were kept informed of the driving schedule so that cells could be filled up almost immediately after the last sheets were in place. As a precaution, two standby scows were kept filled nearby.

Working around the clock, the contractor averaged two cells and two segments every 24 hours. The tops of the sheets were burned off, providing a 6.75-foot-high wall above high water on the lake side and a 3.25-foot-high wall on the shore side. Stones weighing at least 2.5 tons were set in place as a toe protection on the lake side. The wall was finished by capping the cells with crushed stone.

E. E. Lewitz was superintendent for the Great Lakes Dredge & Dock Co. R. Selfridge was project engineer for the Ohio Department of Highways, which is headed by S. O. Linzell, director, and L. F. Schaeublin, chief engineer. L. L. Drasler is division engineer for the Cleveland area.

THE END

Army Building Totals $145,000,000 in 1953

The Army Corps of Engineers completed 190 military jobs, totaling $145,098,108, within the U. S. during the 1953 fiscal year. Undertaken for the Air Force, the General Services Administration, the Veterans Administration, and the Army, these jobs included barracks, warehouses, plants, hospitals, and the expansion and improvement of existing installations.

Still in progress at Army and Air Force installations at the mid-point of the 1954 fiscal year are 4,045 other similar jobs, whose total construction costs are estimated at $2,130,291,000. These figures do not include extensive work under way by the Corps of Engineers in overseas areas.

An appropriation of $444,322,000 has been requested from Congress for the 1955 fiscal year to be used on the Corps of Engineers civil works program. The amount was part of President Eisenhower's budget, recently submitted to Congress.

Included in the estimate were 13 new construction projects and six resumption jobs. The largest item, $5,400,000, is for the Green River Locks and Dams in Kentucky. The President's budget message specified that it is planned to ask $800,000 as a supplemental estimate for the 1954 fiscal year in order to start operations on the Green River job. The 1955 appropriation would be for the purpose of continuing the construction.

New York State Building And Construction Code

Recently published by the State Building Code Commission, State of New York, 1740 Broadway, New York 19, N. Y., is a "State Building Construction Code Applicable to Multiple Dwellings". The code represents completion by the commission of rules and regulations for all types of residential building and augments the one and two-family dwelling code previously promulgated. Also in print is a booklet containing the "Generally Accepted Standards Applicable to State Building Construction Code".

The new code represents the completion of pioneering code-writing work under the "performance standards" mandated by the Legislature through the State Building Code Law. It provides all municipalities of the state, at their option, with rules and regulations covering 88 per cent of all new projects on which permits are issued. The remaining 12 per cent of construction projects, represented by nonresidential building, will be covered by the third portion of the code being prepared.

Historic American Roads

Volume Two of a series on the development of highways, "Historic American Highways", has just been published by the American Association of State Highway Officials, 917 National Press Bldg., Washington 4, D. C. Volume One, published in 1952, is entitled "Public Roads of the Past".

The new volume, containing 183 pages, covers the history of American highways from the time of the landing of the Spaniards in Florida to the present. It is illustrated and has an extensive bibliography. The first volume covers the period between 3500 B. C. and the 1800's.

Volume One may be purchased from American Association of State Highway Officials at $4.00 per copy. Volume Two is $3.00 per copy; both may be obtained for $6.00.

Reduce lubrication time 50%

Have you ever checked how many hours and how much money go into preventive maintenance over a period of 6 months? This time and cost, which looks small on a daily basis, is a big item over a period of time. You undoubtedly would like to cut it down. A regular program of maintenance helps, as you well know. So does purchase of machines that have fewer fittings, fewer points of service. For your convenience, we have charted earthmoving haulers, scrapers and tractors below. Look it over . . . note that LeTourneau-Westinghouse units have the fewest check-points in every category. For example:

On Rear-Dumps, 11 fittings vs. 233

On 50-ton "A" Tournarocker, there are only *11* grease fittings. There are *233* on a competitive 40-ton rear-dump.

One company using both types of haulers to haul conglomerate rock overburden (Colitz Coal Co., Pottsville, Pa.) reports it takes 8 hours to completely lubricate a competitive truck's many fittings . . . 2 hours to lubricate the big "A" Tournarocker. Says Co-Owner John Colitz, "Since using Tournarockers, we've cut operating costs 40%."

On Scrapers, 1789 fittings vs. 6245 to check per 1000 hrs.

Other LeTourneau-Westinghouse machines, like Tournapull and Tournatractor, also reduce lubrication time. One of the reasons is that LeTourneau-Westinghouse's use of electric motors places the power where it is needed . . . eliminates extra sheaves, long jack-lines, excess lubrication fittings. Competitive units use complicated PCU cable reeving or hydraulic systems requiring two or three times more maintenance.

For instance, Unit W has 38 sheaves to lubricate . . . C Tournapull has only 14 sheaves. In 1,000 working hours, "W" requires service of 4,960 grease fittings and 1,285 oil and other points. In same period of time, LeTourneau-Westinghouse's "C" Roadster requires servicing of only 1,037 grease fittings and 752 other lube points. These 1789 checks compare to 6245 on Unit W, 5515 on Unit V, 8447 on Unit X, 6837 on Unit Z and 6385 on Unit Y.

On tractors, 4 tires take place of 500 track parts

Tournatractor similarly saves lubrication over crawler tractors. Elimination of 450 to 550 moving tracks by 4 rubber-tired wheels cuts down lubrication time. Chart shows that in 6 months you'll spend twice as much time servicing your crawler as you'll put in on your Tournatractor. If your tractors are working in a gritty material, like sand, your crawler will require even more frequent lubrication with consequently greater loss of working time. Your own records show how important a "minor" expense like lubrication costs can be.

There are dozens of other LeTourneau-Westinghouse cost-cutting features it will pay you to investigate before you buy your next machine!

Tournapull, Tournarocker—Trademark Reg. U.S. Pat. Off.
Tournatractor—Trademark G-328-G-b

COMPARATIVE MAINTENANCE REQUIREMENTS

	PER SHIFT OF 8 OR 10 HOURS		PER 1000 HOURS OR 6 MONTHS	
REAR-DUMP HAULERS	Grease Fittings	Misc. Operations	Grease Fittings	Misc. Operations
Unit S	89	9	11,492	1,408
Unit T	40	8	4,133	1,035
Unit U	39	7	4,011	905
LeTOURNEAU-WESTINGHOUSE				
D Tournarocker	4	6	433	752
C Tournarocker	4	6	433	752
A Tournarocker	4	6	434	529
SELF-POWERED SCRAPERS				
Unit V	43	9	4,398	1,117
Unit W	47	12	4,960	1,285
Unit X	71	12	7,110	1,337
Unit Y	58	10	5,833	1,004
Unit Z	65		6,564	221
LeTOURNEAU-WESTINGHOUSE				
D Tournapull	13	6	1,344	764
C Tournapull	10	5	1,037	752
A Tournapull	16	6	1,657	773
TRACTORS				
Comparable Crawler	6	2	876	384
LeTOURNEAU-WESTINGHOUSE	None	5	62	598

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

New Jersey Bridges To Get Antiskid Treatment

Here is the serrating machine, owned and operated by the Reliance Steel Co., McKeesport, Pa., that is being used on New Jersey bridges.

Continuing its program to bring added safety to its steel grid deck highway bridges, the New Jersey State Highway Department has made plans for the serration of the decks of seven spans, bringing the total number of bridges which will have been subjected to the antiskid serrating process to ten.

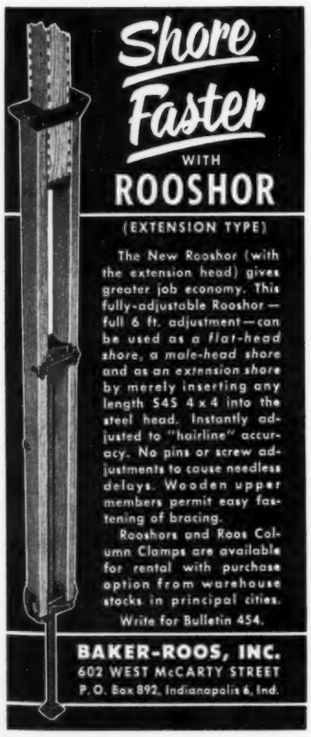
The procedure, designed to minimize skidding in wet weather, provides for the cutting of hundreds of notches in the deck at intervals of approximately one inch. The serrations are 3/16 inch deep and 3/8 inch wide.

The cutting is done by a special machine manufactured and owned by the Reliance Steel Co., McKeesport, Pa. Weighing 8 tons, the rig has a battery of six steel cutting disks and is powered by a 50-hp motor. It is capable of serrating about 1,000 square feet of steel grid per day and rides on channels laid on the deck.

Work on the seven bridges will be performed on a rigid schedule which will keep traffic interference to a minimum. All the spans will be completed in 42 working days.

Steel grid flooring has been widely used on state bridges because it is cheaper and lighter than concrete decks and eliminates the accumulation of snow. On new construction and on the replacement of worn-out wooden decks, the highway department is now specifying a new design of grid which does not induce skidding.

March Is Red Cross Month
Join and Serve



Shore Faster WITH ROOSHOR

(EXTENSION TYPE)

The New Rooshor (with the extension head) gives greater job economy. This fully-adjustable Rooshor—full 6 ft. adjustment—can be used as a *flat-head shore*, a *male-head shore* and as an *extension shore* by merely inserting any length S4S 4 x 4 into the steel head. Instantly adjusted to "hairline" accuracy. No pins or screw adjustments to cause needless delays. Wooden upper members permit easy fastening of bracing.

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities.

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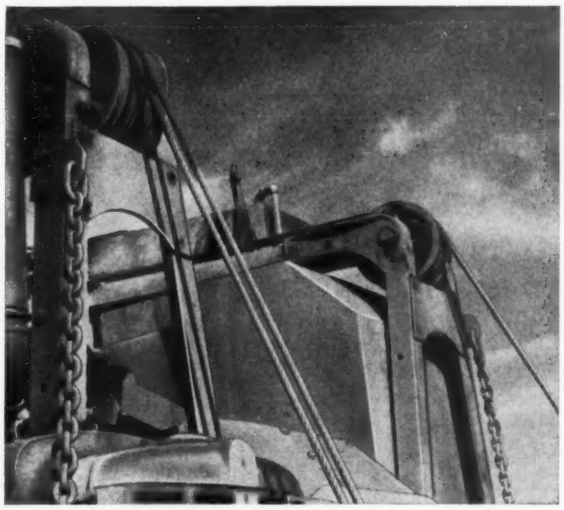
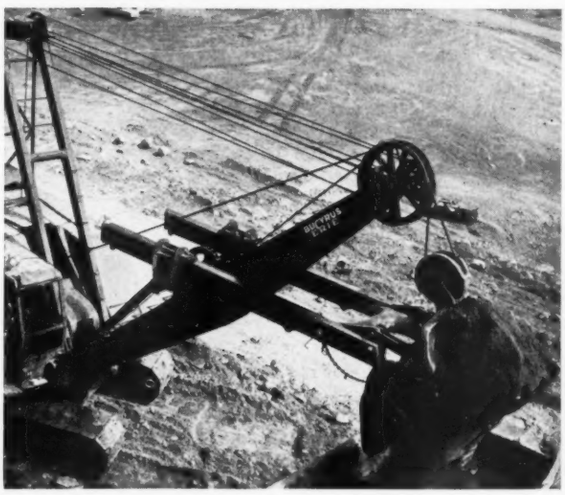
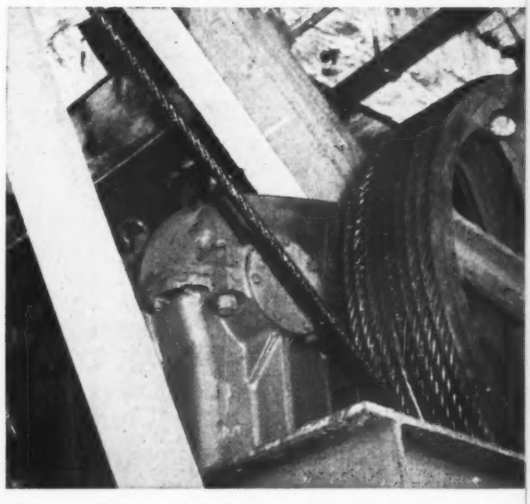


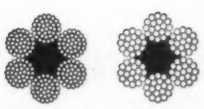




EXTRA FLEXIBILITY—Wire rope encounters fast sheave action, reverse bending, constant stop-and-start operation on many jobs. When this same rope must also lift or pull heavy loads, an unusually flexible, strong wire rope is needed.

Rope jobs like paver skip hoists, overhead cranes, large shovel and dragline hoists, and sawmill carriages demand these qualities. That's where the use of 6 x 37 Red-Strand wire rope saves time and money.

Where will 6x37 Red-Strand improve your wire rope service?



6 x 37 6 x 19

Look at a cross section of 6 x 37 wire rope. You see three rings of small, uniformly sized wires in each strand. This differs from a rope construction like 6 x 19, which contains fewer and larger wires.

The *smaller size* wires make 6 x 37 more *flexible*. The *larger number* of wires maintains rope *strength*.

Would this combination improve your wire rope service? Would it solve a problem for you? Leschen's higher-than-rated quality is also providing longer-than-expected service to heavy industry everywhere.

Check with your Leschen man. He can help you.

Leschen's 64-page Wire Rope Handbook tells you all about 6 x 37 and other Red-Strand wire rope constructions. Ask or send for your free copy.

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri

LESCHEN
HERCULES Red-Strand WIRE ROPE

Settling Basin Just An Earth-Moving Job

Standard grading equipment is used for mining firm's 400-acre ore-washing reservoir in Minnesota

A Model C Tournapull spreads a load of fill in a thin layer along the dike. Fill was placed in 5 to 6-inch lifts.

SETTLING BASINS for collecting the tailings from ore-washing operations are an important part of the open-pit mining industry in northern Minnesota. Building the big basins is an earth-moving job readily done with standard grading equipment. Such a project, a 400-acre basin, was recently constructed for the M. A. Hanna Co. at Cooley, Minn., by contractor Leon Joyce, Rochester, Minn.

The job involved widening, improving, and deepening an old settling basin. Joyce constructed approximately 14,000 feet of earth dike, averaging 22 feet in height with a 30-foot top. Sideslopes are 1½ to 1 on the outer side and 2 to 1 on the inside. A natural hill forms the bank on one side of the basin. The dike is in the shape of a huge, somewhat irregular horseshoe with the hill closing the open end.

Earth-Moving

Four Model C Tournapulls handled a large part of the 645,000 cubic yards of material, especially on the longer hauls. On shorter hauls, two Caterpillar D8 tractors with Gar Wood scrapers were used. These scrapers had a capacity of 22 cubic yards.

The sand-silt soil of which the dike is built was obtained from large shallow borrow pits, some within and some on the outside of the reservoir. This material was placed in lifts of 5 to 6 inches and compacted by the hauling equipment and the dozers used on the fill. No additional compaction was used, and no moisture was added to the materials. Any tendency of the impounded water to seep through the dike would soon be eliminated by the filtering action which would remove fines from the water and thus build up an impervious lining on the inner face of the dike.

In the borrow pits, the Tournapulls were double push-loaded by two Caterpillar D8 tractors. The tractor-scrapers were assisted in the loading cycle by a single D8 pusher. On the dikes, Caterpillar D6 and D8 tractors with dozers spread and compacted the fill. An Austin-Western 99 motor grader maintained haul roads and assisted in leveling and shaping the fills.

Borrow areas and parts of the reservoir and like areas had to be cleared before starting the earthwork. The dense growth of poplar and jack pine was cleared by the Caterpillar tractors and dozers. Trees and brush were dozed into piles and burned on the site. Around 70 acres of land was cleared, about half within the reservoir area.

At one point, the alignment of the new dike crossed a portion of the old settling basin where the old tailings had accumulated to depths up to 15 feet. The owners did not wish to bury this material under the new dike fill; they wanted to be able to reclaim it in the future.

A Northwest 3-yard dragline was brought in to dig out the ore ahead of the fill. The dragline worked from the end of the fill reaching out about 50 feet at a setting and digging a trench approximately 100 feet wide to natural ground at the bottom of the old basin. The excavated material was simply cast over into the new pond.

When a section had been excavated, the hauling equipment moved in and carried the fill forward. The

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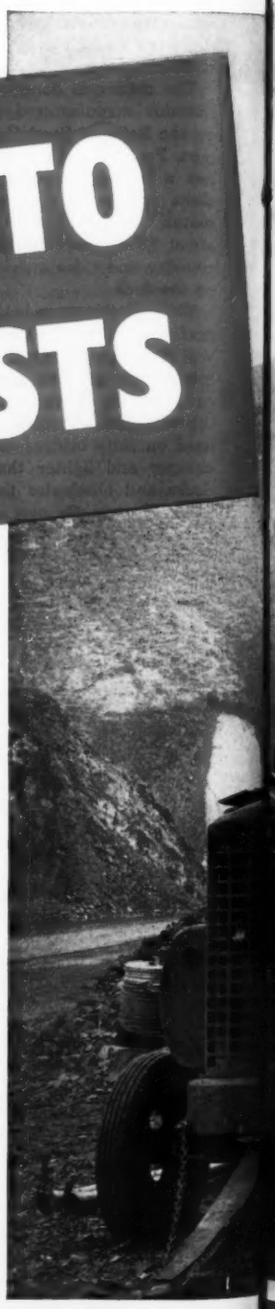

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There is a complete line of Texaco air compressor oils to assure clean, efficient, low cost performance from every type and size of compressor, under every operating condition. A Texaco Lubrication Engineer will gladly recommend the one exactly right to give *you* best results.

For your rock drills—to extend their life and reduce maintenance costs—use *Texaco Rock Drill Lubricant EP.* Its extreme pressure properties protect against wear, and it prevents rust whether drills are running or idle.

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CONTRACTORS AND ENGINEERS

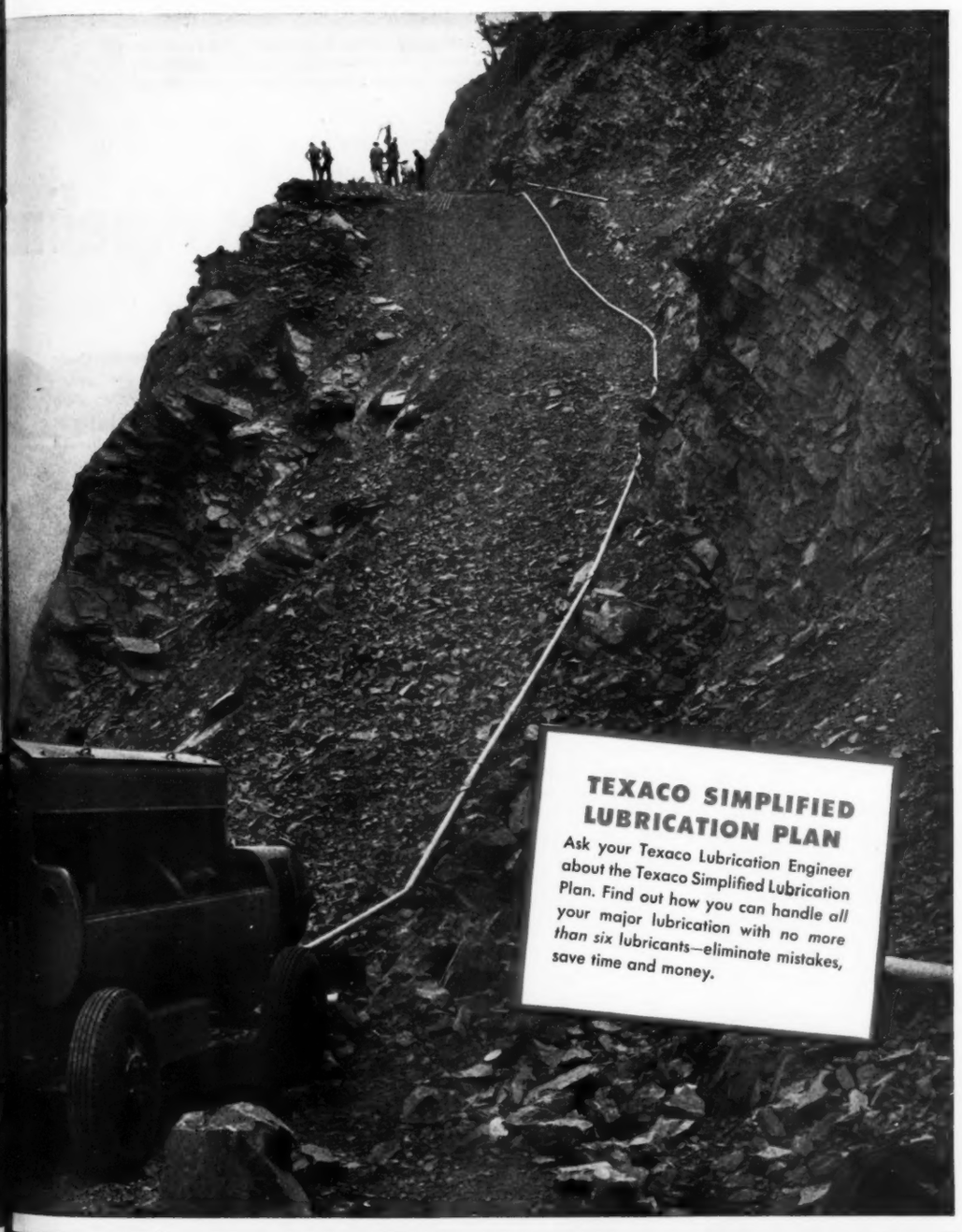
Caterpillar D8's pull and push a Gar Wood scraper, loading it with 22 yards of sand-silt soil for the settling basin dike.

C&E Staff Photo

dragline then moved ahead onto the new fill and repeated the operation. This section through the old basin was approximately 500 feet long. The fill was brought up to about four feet above water level by pushing the material over the end of the fill with dozers.

When the entire section had been brought up to this height, the remaining fill of approximately 15-foot depth was placed in shallow layers as previously described. This high supercharge, together with the vibrating effect of the equipment, was expected to produce a satisfactory density in the lower portions of the fill.

The project was started May 25, 1953, and completed October 20. The crews worked a 60-hour week consisting of five 12-hour days. Norman Hovind was superintendent for Leon Joyce. THE END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Highway Statistics For 1952 is Issued

The Bureau of Public Roads, U. S. Department of Commerce, has published "Highway Statistics, 1952", the eighth of a series which presents annual statistical and analytical tables of general interest on such subjects as motor fuel, motor vehicles, highway-user taxation, highway financing, and highway mileage.

Because of budgetary restrictions, the limited free distribution formerly made by the bureau has been curtailed. The 142-page booklet may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 75 cents per copy. Except for the 1950 issue, previous editions of this series, as well as "Highway Statistics, Summary to 1945", can be obtained from the same office at prices ranging between 35 and 65 cents each.

Subsurface Surveys Now Geo-Research

Rapidly expanding operations have necessitated a change in the name of Subsurface Surveys to Geo-Research. The division is part of the Institute of Industrial Research, Syracuse, N. Y., and is engaged in studying problems inherent in practically all engineering and construction projects, as well as other applied aspects of geology, geophysics, and mineralogy.

Its former division base outgrown, Geo-Research has moved to larger quarters with modern laboratories and shops at 1331-33 E. Colvin St., Syracuse. The division's business office is at Lyman Hall, Syracuse 10.

In line with expanding activities, Russell F. Kaiser has been appointed to the staff of Geo-Research as an engineering geologist in charge of field operations. Carl E. Helbock, a geologist, has been added as a field representative.

Thew District Manager

The new southeastern district sales manager for The Thew Shovel Co., Lorain, Ohio, is Robert W. Bairstow, who will be responsible for sales of Thew products in the states of Georgia, Florida, North and South Carolina, and the eastern section of Tennessee.

1 Brush is stacked for burning by an Oliver OC-18 tractor with angle dozer. Other tractors were busy ripping out stumps and dozing away muck in the swamp areas. Below, a workman with a McCullough saw cuts up the timber.

2 The 6-foot-deep trench which accommodates the pipeline is dug by a Cleveland pipeline trencher along a level portion of the route. The 60-foot right-of-way was just as dense as the adjacent wilderness before the clearing operations.

C&E Staff Photos

Complete 645-Mile Pipeline

By RALPH MONSON, Field Editor

PLACING 645 MILES of 30-inch crude-oil pipeline, including a section under the difficult Strait of Mackinac, in only six months seems like an impossible feat. Nevertheless, with the cooperation of 10 major firms under the coordination of the Bechtel Corp., the project was not only undertaken, but was also completed on schedule.

Known as the Lakehead Pipeline Extension, the line carries Canadian crude oil from the lakehead ports of Duluth, Minn., and Superior, Wis., to Sarnia, Ont., traveling across northern Wisconsin and upper Michigan, under the Strait of Mackinac, southeasterly across lower Michigan, and under the St. Clair River. It provides for the year-round flow of oil from the Canadian fields in Alberta to the refineries at Sarnia, eliminating the five-month interruption caused by the suspension of shipping on the Great Lakes each winter.

Seven Spreads

The pipeline construction was divided into seven spreads, varying in length from 75 to about 100 miles. Spread 1 was built by the E. J. Mahoney Contracting Co., Lansing, Mich. The Anderson Bros. Corp., Houston, Texas, took care of Spreads 2 and 3. Midwestern Constructors,

5 Forty-foot sections of the pipe are unloaded from a trailer by an Allis-Chalmers HD-10 with a Berg side boom. The lengths of pipe, which weigh more than a ton each, were strung along the edge of the trench in preparation for welding.

6 After a bending machine shaped the pipe to the contours of the trench, the sections were clamped together and welded. A Trackson side boom supports the pipe while three workmen weld a transition sleeve with 300-amp Lincoln arc welders.

3 Along sections of the route where the trench had to be dug on a grade, backhoes were used. Here, an Insley is at work. Note the lugs that are welded to the crawler track pads to improve the machine's traction on the grade.

4 Rock was encountered in the stream bed. A Worthington wagon drill, suspended from the bucket of a Unit 1020A backhoe, bores holes for blasting while a 3-inch Barnes pump holds down the water level. The compressor is a Worthington.

nan 6 Months

Crews vie for speed honors on crude-oil line through Wisconsin and Michigan; ten firms handle project

Inc., Poplar Bluff, Mo., placed Spread 4 and also the 2,500-foot St. Clair River crossing from Port Huron, Mich., to Sarnia.

Spread 5, on the south shore of the Strait of Mackinac, was built by the pipeline division of the Bechtel Corp., San Francisco, Calif. (Bechtel acted as owner's agent in the overall supervision of all the spreads.) Spreads 6 and 7 were constructed by the Conyes Construction Corp., San Pablo, Calif. The Canadian portion of the pipeline was built by F. E. Shaw, Sarnia, Ont.

The 21,000-foot Strait of Mackinac crossing was built by Merritt-Chapman & Scott, New York City (see "Twin Pipelines Cross Deep Four-Mile Strait", CONTRACTORS AND ENGINEERS, December, 1953, pg. 42). The line was carried across the Saginaw River near Bay City, Mich., by W. J. Meagher & Sons, Inc., Bay City.

Surveying

Surveying was contracted to Lockwood, Kessler & Bartlett, Inc., Great Neck, N. Y. The Walco Engineering & Construction Co., Tulsa, Okla. built the one pumping station. Aerial survey photographs were taken by the Aero Exploration Co., of Tulsa.

The present capacity of the pipeline, with the one pumping station, is 120,000 barrels per day. By adding five more pumping stations, the capacity can be increased to approximately 300,000 barrels per day. Oil flows through the lines at the rate of 3 mph. Three million barrels of crude oil are required to fill the pipe. At current prices, this represents more than $6,000,000 worth of oil.

The route of the pipeline is based on the aerial surveys, with relocations having been made in the field where necessary. Field staking of the line began in January, 1953, with most of the 14 field parties working on snowshoes. An experienced pipeline locator accompanied each of the parties, making the field adjustments to avoid obstacles which did not show up in the aerial pictures.

Obtaining Right-of-Ways

All property owners along the route were contacted to obtain the 60-foot easements on which to lay the pipe. Under the terms of the agreements with the landowners, timber was salvaged, fences were replaced, drain tile and underground utilities were protected, and every other effort was made to cause the landowners and public a minimum of inconvenience.

Clearing, grading, and ditching operations utilized many of the

(Concluded on next page)

7 Before the lengths of pipe were placed in the trench, they were cleaned, given a protective coating of primer and hot enamel, and wrapped in Fiberglas. Below, a welded length is lowered into place by Caterpillar D8 tractors with side booms.

8 The long lengths of pipe were welded into one continuous strip in the trench and coated and wrapped by hand. Then the pipeline was backfilled with dirt. Here, a Caterpillar D7 tractor with a long side boom and a backfiller is at work.

Where the pipeline had to cross railroad tracks, it was incased in a sleeve. The Lima crane in the foreground is cleaning up the trench at the near end of the sleeve.

(Continued from preceding page)

standard machines found on other types of earth-moving jobs: chain saws, tractors with dozers and winches, draglines, pull shovels, rock drills, and the like. Tractors with side booms and a host of special pipeline machines were used in the bulk of the remaining operations. Pipe benders, cleaning and priming equipment, and coating and wrapping rigs are some of the specialized machines which made it possible to lay the large underground lines at a fantastic pace.

The Route

The pipe was fashioned from 153,000 tons of steel and required approximately 5,000 railroad freight cars for delivery. In the 645 miles of line, there are intersections with five navigable rivers and straits, 38 other rivers, 48 creeks, 44 rail lines, and 51 highways. The total cost of the project was about $90,000,000.

With five contractors on the pipelaying part of the project trying to outdo each other for honors, exceptional speed records were attained. A "steeplechase" was organized in which trophies were awarded to the crews that were first to complete 25, 50, 75, and 85 miles of line. Monthly reports were published describing what each crew was doing and their relative standings. This competition undoubtedly played an important part in the speedy and successful completion of the job. THE END

Ceco Steel Promotions

Harold D. Jolley has been appointed to the newly created position of senior vice president and manager of sales for Ceco Steel Products Corp., Chicago, maker of metal building products. Elmer T. Gustafson has assumed Mr. Jolley's former duties as vice president of the structural products division, while C. Foster Brown, Jr., has become vice president and assistant to the president.

George R. Wernisch has replaced Mr. Gustafson as eastern regional manager, while Howard J. Richter has become manager of the steel joist and roof deck department, and N. H. Bell has been named manager of the aluminum window department of the company.

Here's Big News!

FORD'S LATEST "172" CU. IN. ENGINE

★ OVERHEAD-VALVE
★ LARGE BORE
★ SHORT-STROKE
★ DEEP RIGID BLOCK

Pictured here are two types of sheet metal available with this Ford "172" 4-Cyl. Power Unit. Either type can also be specified with the Ford "134" 4-Cyl. Power Unit.

Ford
INDUSTRIAL ENGINES AND POWER UNITS

Here is another Ford power plant of the most modern large bore, short-stroke, low-friction design . . . engineered, built and tested *exclusively* for *industrial* applications!

This new Ford engine delivers the mightiest concentration of power *per cubic inch* of any engine of comparable size and weight. With only 172 cu. in. displacement, this 4-cylinder engine attains a maximum of 58 brake horsepower at 2400 rpm. Less displacement normally requires less gas which means greater daily operating economy. Other outstanding features of this new Ford "172" Heavy Duty Industrial Engine are listed below.

Glance through them now and don't hesitate to ask or write for a detailed folder with complete specifications or any other information on the latest in engine design. *Write to:*

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY
15050 Woodward Avenue, Highland Park 3, Michigan

Features that Provide Highest Performance and Outstanding Economy

Large bore (3.90 in.) combined with *short stroke* (3.60) cuts piston travel, reduces friction, delivers more power at clutch and reduces fuel costs.

Deep-skirted crankcase is a feature that provides high structural rigidity for more efficient operation and longer life.

Precision-molded alloy iron crankshaft, fully counter-balanced in motion with mirror-like bearing surfaces that reduce friction to a minimum.

Free-turn valves (intake and exhaust) for even wear to help maintain high compression for longer than average period and reduce the possibility of valve sticking.

Weather-proofed ignition provides molded rubber integral seals for all spark plug terminals and lead wires. Distributor also tightly sealed against dust and dampness.

Full-flow oil filter with full-pressure lubrication contributes to longer engine life.

Autothermic pistons of cam-ground aluminum alloy with steel struts for controlled piston-to-sleeve clearance.

Full-length water jackets surrounding each cylinder to maintain uniform temperature, which in turn minimizes bore distortion and reduces wear.

Fast-acting, fully lubricated, variable speed governor is mounted on crankshaft as an integral part of engine.

Every Ford Industrial Engine from 134 cu. in. to 317 cu. in. is a complete, precision-built "Power Package," delivered fully equipped, tested and ready-to-run. All are available as Engine Assemblies or Complete Power Units with a wide variety of accessories and adaptations to fit your job.

The Whitney Jensen No. 455 angle-iron combination unit consists of an angle-iron shear, a mitre notcher, and a bender. It is mounted on a stand and has a 72-inch operating bar handle. Capacity is 2 x 2 x ¼-inch angle iron. For further information write to Whitney Metal Tool Co., Rockford, Ill., or use the Request Card on page 18. Circle No. 118.

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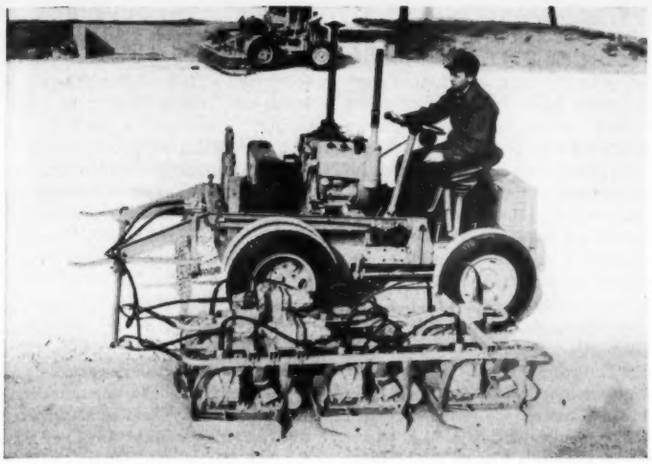


Jackson compactors are side-mounted for road-widening work.

Multiple Compactor For Road Widening

■ Its multiple vibratory tamper, which is used for keying and filling rock-base courses in macadam road construction, has been adapted for the consolidation of materials in flexible base-course widening operations, Jackson Vibrators, Inc., Ludington, Mich., reports. In this application, the six vibratory compactor units, which are normally mounted ahead of the tractor for standard road construction, are assembled in tandem in a single or double row using a frame available from the manufacturer. The assembled compactors are towed at the side of the tractor over the widening strip. With this arrangement, complete compaction is achieved in one pass, according to the company.

Although the individual compactor units in the standard assembly are furnished with bases 26 inches wide, special bases may be had from 12 inches up in widths to meet every widening requirement. Conversion from one type of operation to the other is said to be fast.

For further information write to the company, or use the Request Card at page 18. Circle No. 47.

Surveying Guide

The 1954 edition of "Solar Ephemeris and Polaris Tables" has been published by C. L. Berger & Sons, Inc., 37 Williams St., Boston 19, Mass., manufacturer of surveying and engineering instruments. The 96-page booklet, containing complete instructions for determining azimuths from the sun and the altitude of Polaris, was prepared by Herman J. Shea, associate professor of surveying, Massachusetts Institute of Technology.

The booklet may be obtained from C. L. Berger & Sons, Inc., for 50 cents per copy.

New Dump-Body Hoist

■ A new 8½-ton-capacity dump-body hoist is announced by the Galion Allsteel Body Co., Galion, Ohio. The capacity of the Model 740 is rated on the basis of a 10-foot 4-cubic-yard dump body.

The unit has an all-steel subframe with underbody double lift arms. The piston rod is 2½ inches in diameter, and the stroke is 19⅛ inches. There are 4.3 gallons of oil in the hydraulic system, and the piston stroke oil displacement is 765 cubic inches. Cylinder diameter is 7.156 inches. Mounting height is 14 inches and the hoist has a 50-degree dump angle.

The hoist is equipped with a heavy-duty pump for either vertical or horizontal application.

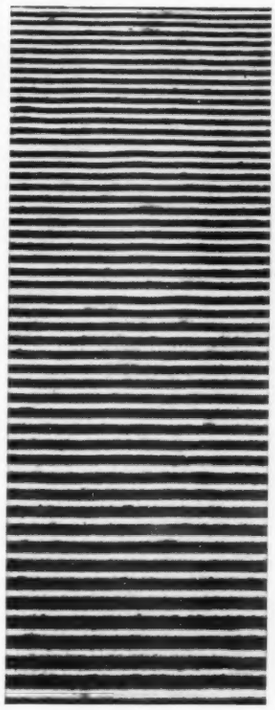
For further information write to the company, or use the Request Card at page 18. Circle No. 110.

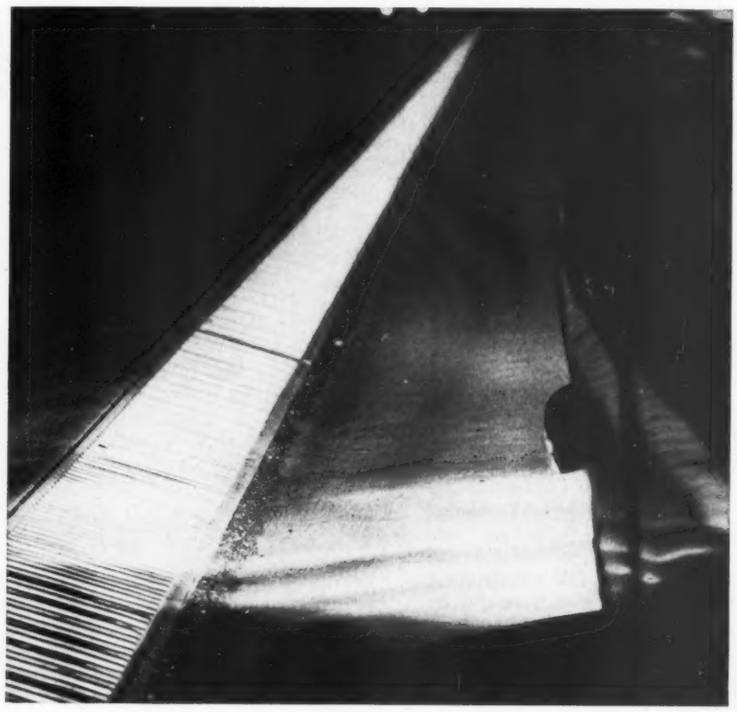
Cellular-Glass Insulation

■ A catalog on a cellular-glass insulation is available from the Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa. The publication lists condensed specifications for the application of Foamglas in walls, ceilings, floors, roofs, perimeters, and in low-temperature space insulation. Complete information on all accessory materials is also given.

Physical properties, characteristics, and performance data of the cellular-glass insulation are fully covered. The new catalog also has photographs of actual installations.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 21.



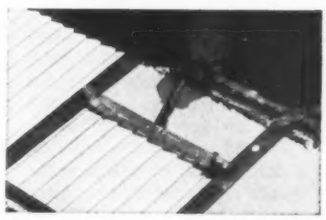


Mark of a safer highway

White concrete reflecting curbs and markers make modern highway lanes more visible to drivers—day and night. That's why so many highways today make driving safer round the clock—with White Concrete Reflecting Curbs and Traffic Markers made with Atlas White Cement.

Corrugated faces on these safer driving aids are scientifically designed to reflect headlight beams back to the driver. At night, these faces catch the light and become bright white guides to curves, hills and merging traffic. In the rain—when it's needed most—this reflection is even more effective. During the day, the true white of Atlas White Cement stands in marked contrast to the darker highway pavement and shoulders.

More and more engineers are specifying White Concrete Reflecting Curb for greater highway safety. Investigate it for *your* next project. For complete information, write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.



Fast, easy placement with Atlas White Duraplastic* Cement mortar mix. One method is to place mix on grey concrete base, screed to one-inch thickness and score with hand tool. Duraplastic air-entraining cement makes mixes more workable, plastic and easy to place.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

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SHELDON TRACTOR FILLER CO
CUNNINGHAM - - KANSAS

Names in the News

Norman M. Pritchett, chief engineer of the Maryland State Roads Commission.

Pritchett Head Engineer For State of Maryland

Norman M. Pritchett has succeeded William F. Childs, Jr., as chief engineer of the Maryland State Roads Commission. He takes the position after 26 years with the commission, having started as a rodman on a survey party. He attended Johns Hopkins University Engineering Night School.

Mr. Childs has retired after 36 years with the commission. Now 67, he will continue as an advisory engineer until he reaches the compulsory retirement age of 70.

Dr. Steinman Awarded William Proctor Prize

Eminent New York bridge designer Dr. David B. Steinman has received the annual William Proctor Prize for Scientific Achievement. The award was made recently at the Hotel Statler in New York City by the board of governors of the Scientific Research Society of America. The late Dr. Proctor was a founder and board member of the organization.

The recipient of the $1,000 award has been designer or consulting engineer on many famous bridges throughout the world, including the one at Florianopolis, Brazil, largest in South America; the Carquinez Strait Bridge in California, longest cantilever in the United States; the Tri-Borough and Henry Hudson bridges in New York City; the Sydney Harbor Bridge in Australia; and the Cologne-Mulheim bridge over the Rhine.

Dr. Steinman is president of the New York Academy of Science and was recently given an honorary degree and medal by the University of Ghent. He holds degrees from City College of New York and Columbia University.

On Fruin-Colnon Board

A vice president of the Fruin-Colnon Contracting Co., Robert D. Mudd, has been elected to the board of directors of the St. Louis, Mo., firm. Mr. Mudd joined the organization in 1943 as assistant to the president, subsequently becoming contract manager and then vice president.

Charles Bigelow Retires

After 45 years with the firm, the last 22 as west coast district manager, Charles A. Bigelow has retired from the Stone & Webster Engineering Corp., New York City. N. M. Floyd has assumed the management of the San Francisco office, and W. L. Sheets, the Los Anegles office.

Mr. Bigelow was also a vice president and director of Stone & Webster. Mr. Sheets has been named general superintendent for the western area, in addition to his duties in Los Angeles.

J. S. Macdonald Dies

One of the leading authorities on heavy engineering and tunnel construction, John S. Macdonald, died recently after suffering a heart attack. He was 60 years old.

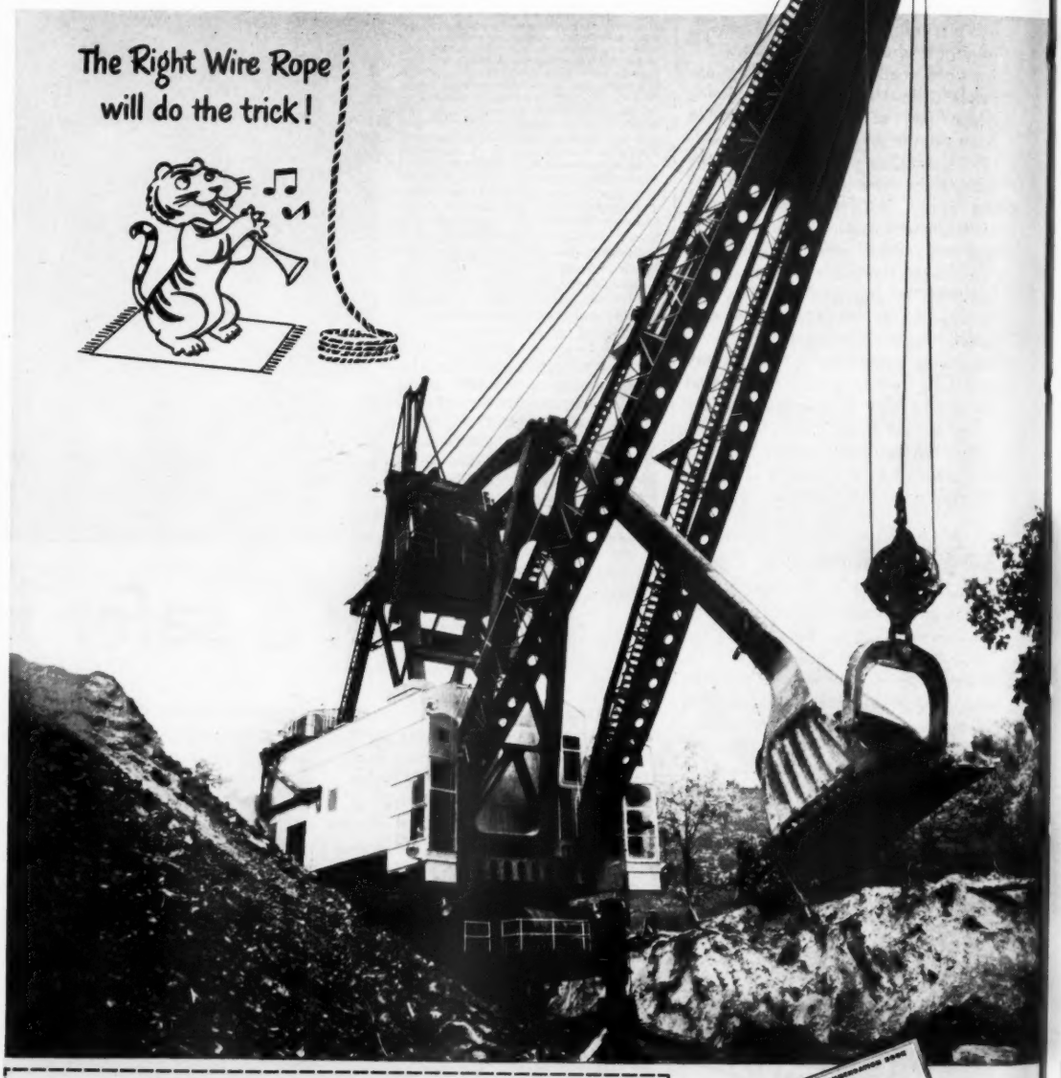
Mr. Macdonald had supervised the engineering of some of the largest construction projects in the country, including the Queens-Midtown Tunnel in New York City, the Delaware Aqueduct, the North Broad Street subway in Philadelphia, and the New York Naval Shipyard in Brooklyn.

Mr. Macdonald was vice president and chief engineer of the Walsh Construction Co. of New York City. It was one of the firms awarded contracts for building the headquarters of the United Nations in New York City and the Atomic Energy Commission's Knolls Laboratory at Niskayuna, N. Y.

Mr. Macdonald graduated from Dartmouth College in 1913, going on to receive a civil engineering degree from the Thayer School at Dartmouth. Even before obtaining his engineering degree, he started working for Patrick McGovern, Inc., as an assistant engineer and eventually became vice president and chief engineer. He joined Walsh upon the dissolution of the McGovern firm in 1935.

In 1941, Mr. Macdonald received The Moles Award for "significant contributions to construction." The Moles is a society of engineers and corporations engaged in tunnel construction. Mr. Macdonald received the award for his work on the Queens-Midtown Tunnel in New York, N. Y., which was completed in 1940 under the East River.

12,587 carloads of



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Brown & Root Appointee

A. J. Mundy, Jr., has been made a vice president of the engineering and construction firm of Brown & Root, Inc., Houston, Texas, with whom he has been since 1946. At the time of his promotion, he was a division manager in charge of Canadian operations.

Mr. Mundy is a graduate of the Georgia School of Technology. He started his career with Robert & Co., Atlanta, Ga., in 1929, staying with the firm in various capacities until 1942. At one time, he was a construction engineer for the Kaiser Corp. of California. He also has three years' experience as a private consulting engineer in his home town of Atlanta.

Mr. Mundy joined Brown & Root as head of design and construction for paving, utility systems, and industrial work in the Houston area.

EJC Elects Saville

New York University's dean of the College of Engineering, Dr. Thorndike Saville, has been elected president of the Engineers Joint Council for this year. Dr. Saville, a past president of the American Society for Engineering Education and past director of the American Society of Civil Engineers, has served on various boards and commissions and as a consulting engineer on projects in his field.

Elected vice president of the Council is Carlton S. Proctor, president of the consulting firm of Moran, Proctor, Mueser & Rutledge. Like Dr. Saville, he is also a former president of the ASCE.

On the executive committee, beside Dr. Saville and Mr. Proctor, are W. M. Pierce, F. S. Blackall, Jr., C. H. Capen, W. J. Barrett, L. R. Sanford, and C. G. Kirkbride.

Consulting Engineers Re-Elect Burnside Value

Burnside R. Value, of Seelye, Stevenson, Value & Knecht, has been re-elected president of the New York Association of Consulting Engineers for a second term. Re-elected to other posts in the association were V. L. Falotico, vice president; John M. Pryke, secretary; and Harry H. Bond, treasurer.

Serving on the executive committee with these officers are John F. Hennessy of Syska & Hennessy, William H. Eipel of Tuck & Eipel, and Darl Hunt of Krey & Hunt.

overburden moved with one Tiger Brand Hoist Rope

IMAGINE 12,587 50-ton freight cars strung out end-to-end. They would make a train more than 80 miles long; and if each car was level full, the entire train would contain 1,000,000 cubic yards of material. That's how much overburden this big coal stripping shovel moved with one American Tiger Brand Hoist Rope.

Despite hard digging, a 2⅜" Tiger Brand Wire Rope lifted and lowered the fully loaded 45 cu. yd. bucket *20,000* times before it had to be replaced. This equipment is used by Central Ohio Coal Company which supplies coal for The Ohio Power Company's new Muskingum River electric power generating plant. This company also uses Tiger Brand Wire Rope on its 18 cu. yd. shovels.

You will like Tiger Brand, too. It lasts long in *any* type of service.

Send the coupon for our recommendations of the right rope to use on your machines.

Regular lubrication of sheaves helps prevent excessive wear of the Tiger Brand Ropes on these big machines.

This 18 cu. yd. electric shovel and the 45 cu. yd. job shown on the opposite page are stripping overburden 3 shifts a day *every* day at Central Ohio Coal Co.'s big Muskingum Mine near Zanesville, Ohio. Tiger Brand Rope is giving excellent service on both these hard-working machines.

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Moles Present Awards To Steers and Maxon

At the annual banquet of The Moles in New York City, the organization's awards given annually for outstanding achievement and contribution to the art of heavy construction were presented to J. Rich Steers of New York and Glenway W. Maxon of Dayton, Ohio.

More than a thousand leading construction men from all sections of the country looked on as Mr. Steers, president of J. Rich Steers, Inc., was presented the award by Carlton S. Proctor. Steers' award was made in recognition of his enterprise and engineering skill at home and abroad, especially in the fields of harbor, airfield, and railroad construction.

Lester C. Rogers of Chicago presented the award to Mr. Maxon, head of the Maxon Construction Co., Dayton, Ohio, who was cited for his ability, leadership, and accomplishments, notably in the fields of public service, atomic energy, and lock and dam construction. Cited in particular was the success his company has had in sharing earnings with personnel at all levels.

The awards, given annually by The Moles, 11 W. 42nd St., New York City, go to one member and one nonmember for achievement in the industry. Heading this year's awards committee was William A. Durkin.

Device Changes Angles To Linear Readings

■ Any angle of a sloping surface given in degrees can be translated to inches per foot drop, carpenter square measurements, and percentages of grade by a new plastic converter. The Krollometer is recommended as a time-saver for figuring roof framing, for leveling

floors, and for work on foundations. It is also of value for surveying rough ground, sloping banks and ditches, and grading roads.

The pocket-size meter has two built-in spirit levels and a dial. The angle is set on the dial face by leveling the bubbles in the indicator. All other readings are then made directly from the instrument without additional figuring.

For further information write to Christensen & Kroll, P. O. Box 284, McMinnville, Oreg., or use the Request Card at page 18. Circle No. 84.

Quaker Rubber Appoints

A. M. Lowrey is now serving as assistant general sales manager, western division branches, for Quaker Rubber Corp., Division of H. K. Porter Co., Inc., Philadelphia, Pa. Mr. Lowrey has been associated with the organization for 13 years.

Fine aggregate is unloaded from flat-bottomed gondola cars by a P&H 455A crane with a 1-yard Williams clamshell bucket. *C&E Staff Photos*

The crushed rock base is moistened so that a final planing by the Cleveland Trailgrader, in tow of a Pup roller, will be effective.

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SAVE TIME, TROUBLE and MONEY!

On the construction of a blast furnace foundation for Pittsburgh Coke & Chemical Co. at Neville Island, the use of Franki Displacement Caissons permitted a substantial increase in allowable load. Specifications called for 35-ton friction piles approximately 40 feet long.

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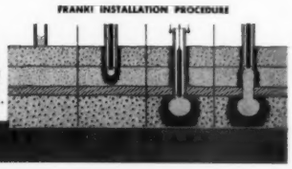

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Divided Highway Paved With 10-

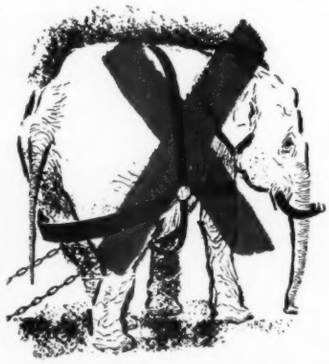
Transverse contraction joints are sawed 24 hours after pour on modernization of U. S. 66 in Illinois

Busy U. S. 66 in Illinois, between Chicago and Springfield, the state capital, advanced two steps in its transition from highway to expressway when a pair of paving projects completed the second lane of the divided highway between Lincoln and Sherman. The two jobs totalled 18½ miles of concrete paving 24 feet wide and 10 inches thick and cost more than $2,000,000.

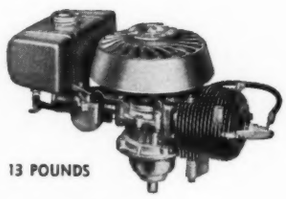
One of the jobs was the 9-mile stretch between Lincoln and Elkhart, handled by Orr Construction Co., Inc., Chicago Heights, Ill., at a cost of $966,118. The other section, from Elkhart to Sherman, was paved by the O'Connor Construction Co., Springfield, Ill., at a contract price of $1,104,900.

The pavement, one of the heaviest in this part of the country, is reinforced with 6 x 12-inch mesh mats composed of ¼-inch wire, placed 2½ inches below the surface. The center joint is tied with ⅝-inch bars 30 inches long spaced at 2½-foot centers. Contraction joints have 1-inch plain round rods with metal expansion caps spaced at 13½-inch centers.

The center joint of the roadway consists of a deformed steel plate held erect and in place by steel pins driven, through holes in the deformation, into the base. The center



be modern—go Lightweight



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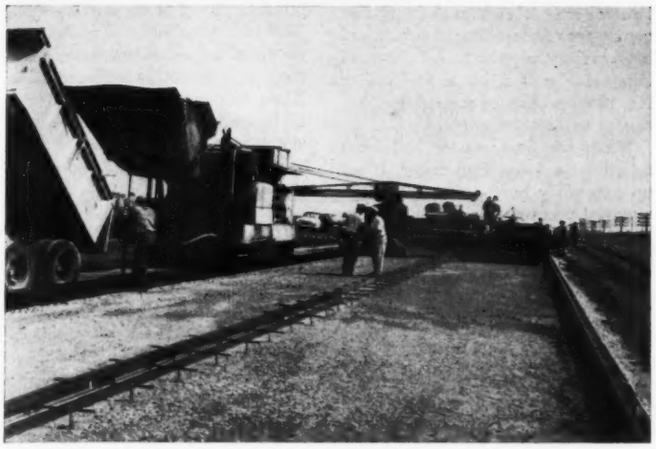

Working outside the forms, a Rex dual-drum paver places concrete as a Blaw-Knox spreader levels the 7½-inch bottom course.

A Clipper concrete saw cuts a 2¾-inch transverse joint about 24 hours after the paving. The joint will be filled with Presstite compound.

ith 10-Inch Concrete

tie bars pass through holes in the plate and are held in place by special steel pins. Load-transfer bars for contraction joints are carefully supported on chairs and placed at 100-foot intervals.

Within 24 hours after the concrete was poured, the transverse contraction joints were sawed to a minimum depth of 2¾ inches and a minimum width of ⅛ inch and filled with joint compound.

The divided roadways are separated by a median measuring 40 feet from slab to slab. Six feet of this median on each side is constructed as inside shoulder. Outside shoulders

(Continued on next page)

If you believe

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SIZE		ENGINE H.P.		
600	134	202	68	33.7
315	75	117	42	35.6
210	51	78.5	27.5	35
160	37	57	20	35
105	25	42.5	17.5	41.6

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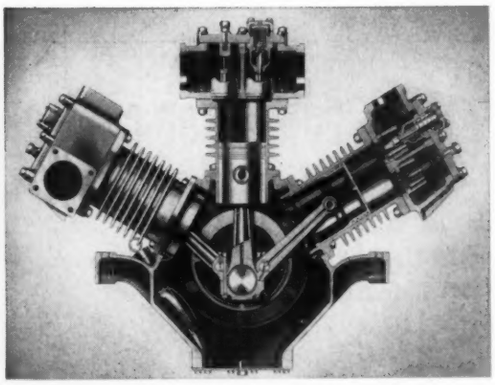

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105'	GASOLINE DIESEL	2.16 1.66	2.35 1.73
160'	GASOLINE DIESEL	3.18 2.45	3.44 2.60
210'	GASOLINE DIESEL	4.32 2.89	4.70 3.06
315'	GASOLINE DIESEL	6.25 4.38	6.75 4.64
600'	DIESEL	6.30	9.20

3. **FUEL ECONOMY.** How does your compressor stack up in comparison with the Blue Brute for economical fuel consumption? The figures shown have been determined under normal field operating conditions.

Get all the facts about the Blue Brute from your nearest Worthington distributor. Or write to Worthington Corporation. Portable Compressor and Contractors' Tool Division, Section H.3.6, Holyoke, Mass.

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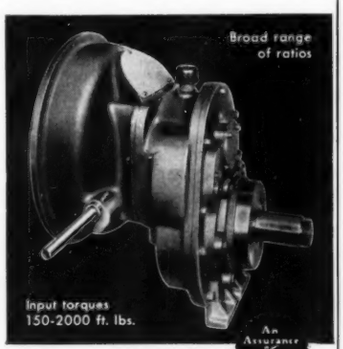

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(Continued from preceding page)

are 10 feet wide. Except on super-elevations, both roadways have a 1½-inch crown sloping both ways from the center line.

Grading and Base

Before starting the paving, it was necessary for the contractor to do the finish grading and place the subbase and base courses. On Orr's contract, this included 214,000 cubic yards of grading. This work was started in May, 1953 and completed by the end of July. Paving operations at the north end of the project were started before the grading had been completed at the south end.

Three Caterpillar D8 tractors with Cat No. 80 scrapers and six Tournapull C Roadsters moved the dirt. These scrapers were push-loaded by two Allis-Chalmers HD-19 tractors. Most of the fill material was obtained from cuts on the right-of-way, with the balance coming from nearby borrow pits. On the fills, the loads were spread in 6-inch layers by the scrapers, spread and shaped further by a Caterpillar D8 and dozer, and compacted by sheepsfoot rollers and disks.

The compaction equipment made an unusual looking train. Two Caterpillar D8 tractors were used, each pulling four sheepsfoot rollers and two tandem Wooldridge road disks. This combination seemed to provide good compaction of the clay soil with a minimum of six passes. Finishing was done by three Caterpillar No. 12 motor graders.

Years ago, when the first lane of the divided highway had been built, the old concrete pavement was broken up and salvaged. Under a separate contract, this pavement was crushed and stockpiled for use as subbase material. Orr used an Allis-Chalmers HD-9 tractor equipped with a Tracto-Shovel front-end loader with 2-yard bucket to transfer this material from the stockpile into trucks which hauled to the roadway.

Subbase material was spread from the trucks with a Blaw-Knox spreader box and compacted to a 3-inch course by pneumatic-tire rollers pulled by a Farmall tractor. Since some of the pieces of broken concrete in this course were too large for fine-grading, the material had to be carefully confined to the 3-inch subbase course and not mixed with the base course.

The base course consists of a 3-inch compacted lift of crushed limestone known in Illinois specifications as Grade 8. This material is substantially a crusher-run stone with 95 to 100 per cent passing the 1-inch screen, and 5 to 15 per cent passing the 200. The material was produced by the Rocky Ford Limestone Co., Lincoln, and trucked to the job.

Limestone base course was also spread with the Blaw-Knox spreader box and compacted with rubber-tire rollers. Finish grading of this course was done after the forms had been set for the paving. A Lakewood subgrader pulled by a Caterpillar No. 12 motor grader shaped the base course to finished grade.

When the base course had been rolled by a 5-ton Pup roller, it set up extremely hard. When dry, the material was too hard to be touched by the Cleveland Trailgrader and had to be watered to soften the surface enough for the final planing. The Pup roller pulled the Trailgrader which was followed by a scratch template for a final check of the finished grade.

Concrete Batch Plant

At the village of Broadwell, about the mid-point of the job, Orr set up a concrete batching plant between the tracks of two railroads. A 300-barrel Butler bulk-cement plant stood beside the Illinois Terminal railroad which bounded the plant area on the east. Aggregates were received on the Gulf, Mobile & Ohio railroad which was on the west.

Sand was delivered to the job in flat-bottomed gondolas and was unloaded and stockpiled by a P&H Model 455A crane using a 1-yard Williams clamshell bucket. This crane also charged the 40-ton Johnson bin from which the sand was weighed out to the batch trucks. Lincoln Sand & Gravel Co., Inc., Lincoln, supplied the sand.

An under-track hopper and pit arrangement provided rapid and convenient unloading of coarse aggregates. A concrete chute extending under the track sloped steeply to a pit beside the track. Two sizes of gravel were received from the Chicago Gravel Co., Joliet, Ill., in bottom-dumping hopper cars. A Caterpillar D8 tractor spotted these cars over the chute so that when the gates were opened, the gravel flowed into the chute and on down into the pit.

A Bucyrus-Erie 38-B crane with a 1½-yard Williams clamshell bucket bailed the material out of the pit and placed it in the stockpiles. The two sizes of coarse aggregate required separate stockpiles and a 100-ton, two-compartment Blaw-Knox hopper for batching. The 38-B crane also kept these coarse-aggregate hoppers filled.

Typical batches contained the following:

Coarse aggregate (2½ to ¾-inch)	1,495 lbs.
Coarse aggregate (1-inch to No. 4)	1,473 lbs.
Fine aggregate	1,588 lbs.
Cement	742 lbs.
Darex AEA	9 oz.

These quantities are for a 37.4-cubic-foot batch. Air content at the mixer was 4½ to 5 per cent, but tests showed that this was reduced at least ½ per cent by the vibrating screed on the spreader. Water was added at the mixer at the rate of 5.1 gallons per sack with a resulting slump of about 1½ inches.

The batch trucks—nine Interna-

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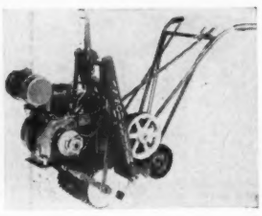

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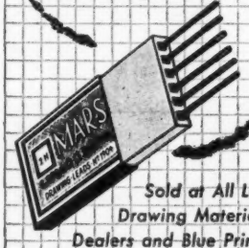

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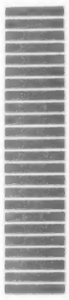

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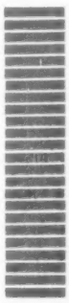

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tional R-170's with tandem rear axles and Galion dump bodies—picked up their charges of coarse aggregates and proceeded to the Butler bin to take on cement. The next stop was the Johnson bin for the loads of fine aggregates. A final stop next to a raised platform gave a workman an opportunity to spread the sand carefully over the cement to prevent loss by blowing during the trip to the paver. This setup took a rather large area, but it was well adapted to the situation where cement and aggregates were delivered by rail.

Pour 1,300 Feet Per Day

The layout was geared to pave 1,300 linear feet per 9½-hour day. Starting on July 9 and working six days per week, weather permitting, the paving was completed by September 15.

Grading for forms, as well as the setting of the 10-inch Heltzel forms, was a hand operation. A mechanical form tamper was used to compact the base under the forms, however. The next step was the placing of the deformed steel center-joint strip. The 10-foot steel plates were aligned by a gage from the form.

The Rex 34-E dual-drum paver traveled on the inside shoulder, making it unnecessary for any equipment to operate over the base once the grading was complete and the center joint and tie bars were placed. The Galion dump boxes on the International trucks carried four batches each. On the longer hauls, additional two-batch trucks were rented.

Water was obtained from the Lincoln municipal system and hauled to the mixer by two 2,000-gallon truck-trailers. Pumps on the tank trucks transferred the water to the mixer. In addition to mixing water, this supply also provided water for wetting down the base just ahead of the pour. Two additional tank trucks with capacities of 1,500 and 2,000 gallons, respectively, hauled the water required for the grading and base operations.

Concrete for the first course was placed on the base by the paver and spread to a depth of about 7½ inches by a Blaw-Knox spreader. A special track section on the spreader raised its screed up and over the center-joint marker on each pass. The spreader's vibrating screed helped to consolidate the mix.

When a 50-foot section of the first course had been laid, the spreader backed up to the beginning of the section while workmen laid in the 11½ to 15-foot reinforcing mats. The paver then backed up and placed the top 2½ inches of concrete.

Following the spreader were a Jaeger-Lakewood finisher and a Koehring longitudinal finisher. After finishing, the surface was carefully straightened by hand and finished by hand belting and a burlap drag. Each day's pour was marked with the date and station number. The numbers were impressed in the fresh concrete with steel dies.

Sisalkraft curing paper was placed as soon after the finishing operations as possible. When the forms were removed the day after the pour, the paper was carefully pulled down over the edges of the slab and weighted with dirt. The paper was left on for 72 hours.

Cutting Contraction Joints

For cutting the transverse contraction joints, Orr used a Clipper concrete saw and Clipper 12-inch blades. The Clipper operator reported getting 1,000 feet or more from each blade.

A truck accompanying the saw was equipped to handle both sawing and joint-filling operations. A 300-gallon tank carried water which was supplied to the saw by a Hobart 1½-inch pump driven by a small gasoline engine. A swinging boom, mounted on a pedestal behind the cab with a cable from a power winch driven from the power takeoff of the truck, picked up and carried the saw between joints. This device was also of great assistance in loading the heavy barrels of joint-filling compound.

Joints were filled with Presstite joint sealer which was pumped from the barrels without heating by a Graco air-operated pump. This is believed to be the first concrete paving in Illinois in which the transverse contraction joints were sawed.

Final treatment of the slab surface after removal of the curing paper consisted of spraying with a light oil preparation. The oil was spread at a rate of 0.07 gallon per square yard of pavement for the purpose of resisting scaling due to application of chlorides to the pavement in winter maintenance operations.

Black dirt for shouldering was borrowed from pits along the right-of-way and hauled to the job by two Tournapull C Roadsters. A Caterpillar No. 12 motor grader finished the shoulders to grade. Shoulders, median, and slopes were all seeded and mulched with straw as a part of the grading contract.

(Concluded on next page, col. 1)

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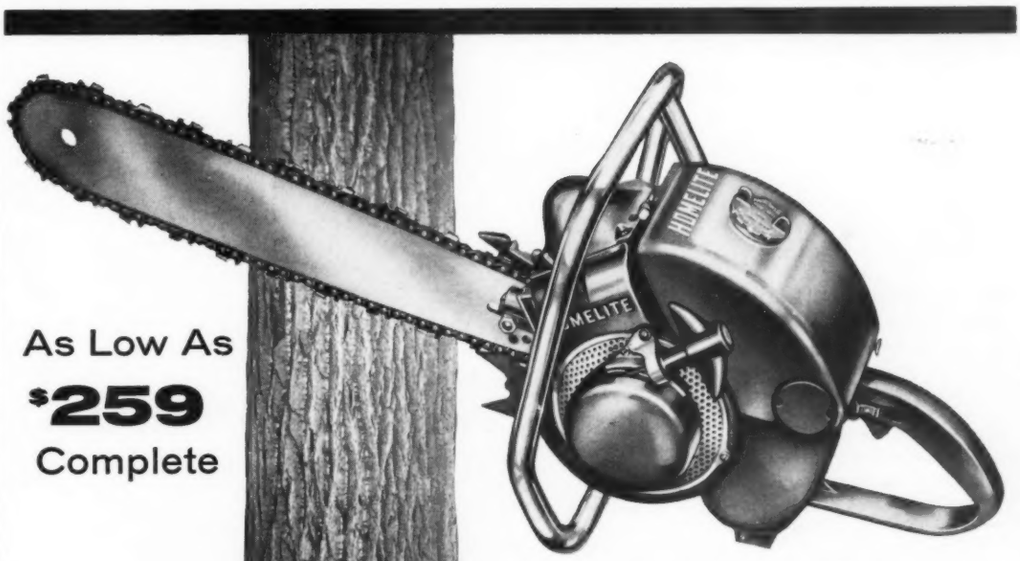

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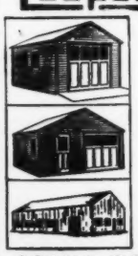


***Easily Erected* STEEL or ALUMINUM BUILDINGS**

for all purposes

- **Field offices**
- **Tool sheds**
- **Storage bldgs.**
- **Garages**

QUICK DELIVERY

Write for Catalog

JOHN COOPER CO.
293 2nd St. • Hackensack, N. J.

This hand-trailer-mounted model is one of a new line of pumps made by Jacuzzi Bros., Inc.

New Portable Pumps For Water Drainage

■ A new and improved line of self-priming centrifugal pumps for contractors is announced by Jacuzzi Bros., Inc., Richmond, Calif. Built to handle muddy or unclear water, the new heavy-duty units are designed for water drainage or any other application where rapid movement of large volumes of water is desired. They are suited for dewatering excavations and quarries.

The design of the pumps features a balanced type of priming port said to prevent loss of capacity due to recirculation of water. Semi-open impellers are nonlogging with adjustable clearance to compensate for wear; a special renewable impeller wear-plate prevents wear on the impeller case itself. A separate opening in the top of the case permits easy priming without the need for extra fittings or for disturbing the piping. These pumps are rated for continuous duty as well as for intermittent service.

The pumps are now available in a wide range of horsepower ratings with a choice of electric motor, gasoline engine, or heavy-duty transmission head for belt drive. For greater ease in handling on job sites, the pumps may be ordered with a lightweight two-wheel hand trailer on ball-bearing-type wheels and semi-pneumatic tires.

For further information write to the company, or use the Request Card at page 18. Circle No. 43.

Leschen Wire Rope News

H. A. Harrington has been appointed assistant general manager of Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis, Mo. Mr. Harrington, who has served the Porter organization as general manager of the spring division and special assistant to the executive vice president, will assist in the over-all management of the Leschen Wire Rope Division.

(Continued from preceding page)

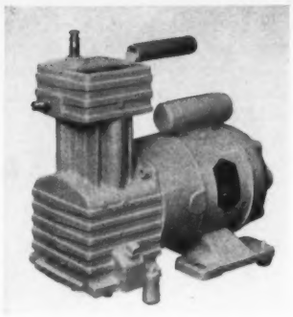
Superintendent on the project for the Orr Construction Co. was Ernest Molyneaux. He was assisted by Hugo Toepfer, mixer foreman; Louis Littell, foreman of subgrade; L. B. Jenson, grading foreman; and Robert Maxwell, master mechanic.

Resident engineer for the Division of Highways of the Illinois Department of Public Works and Buildings was A. V. Van Ausdale. The project was supervised through the office of District 6 of which C. M. Wahl is district engineer and L. J. Collamore is district construction engineer. THE END

Portable Compressor

■ A heavy-duty ½-hp portable air compressor and electric motor unit has been announced by the Sharpe Mfg. Co., 1224 Wall St., Los Angeles, Calif. With conservative loading of its 1,750-rpm motor, the one-cylinder Model 45 compressor delivers 4.5 cfm at 45 pounds pressure. Four new replaceable valve assemblies are used on this model with service simplified so that the same valve unit may be used in either intake or exhaust ports. Splash lubrication services all moving compressor parts.

The simplified endbloc compressor design features a one-piece cast-iron head and case. The large replaceable felt air filter is located for easy inspection and cleaning. Weighing 72 pounds and built with a large non-heating vulcanized fiber handle, the compressor can be handled by one man.



The 4.5-cfm Sharpe compressor.

For further information write to the company, or use the Request Card at page 18. Circle No. 65.

Cylinder Servicing Film

A new film strip with sound, entitled "Servicing the Series 71 Cylinder", has been released by the service department of the Detroit Diesel Engine Division of the General Motors Corp., Detroit 28, Mich. The movie, presenting an effective graphic training aid for mechanics, contractors, and fleet operators, brings together information found in the firm's service manuals and other literature.

Available from Detroit Diesel distributors and dealers, the film covers inspection procedures to be followed in determining the re-usability of cylinder parts during engine overhaul. It also illustrates the step-by-step processing needed to restore such cylinder parts to factory-set standards.

put Moto-Bug® on your payroll . . .
(10 CU. FT. POWER WHEELBARROW)
. . . One
DOES THE WORK OF
3 TO 4
Hauling 1500 pounds or 10 cu. ft. (struck) of bulk materials each trip, Kwik-Mix Moto-Bug easily does the work of 3 to 4 hard-to-get manual laborers. It travels twice as fast and hauls three times as much as a man with an ordinary wheelbarrow. On many jobs, owners report Moto-Bug pays for itself in less than 30 days, from savings in labor alone. It hauls concrete, plaster, brick, tile — anything you can shovel, pile or stack into the hopper body.
Compact, light, Moto-Bug rides to upper stories in regular construction elevators. Or it climbs 20% ramps to the top, fully loaded. 75% of loaded weight on front drive-tires gives plenty of grade-climbing traction. Short 61-inch turning radius, 33-inch width, and hinged riding step, make it easy to clear crowded work areas. Hopper body has instant gravity dump with snub-line control.
No push, no pull — Full power forward and reverse gives fast backing and spotting. Reverse is instantaneous. There's 3.6-to-1 gear ratio on big steering wheel for effortless maneuvering. Dual steering wheels, and optional duals on the drive end, provide plenty of rubber-tired traction, flotation and handling ease on or off pavement.
3-tool usefulness — Interchangeable ¾-ton capacity platform and ½-ton (5-foot) fork lift extend Moto-Bug's labor-saving economies to all kinds of material handling. Check for yourself. See Kwik-Mix distributor or write us for demonstration.
SEND FOR MOTO-BUG JOB REPORTS
to: KWIK-MIX COMPANY
MILWAUKEE, Wis. (Koehring Subsidiary)
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C&E COMPANY
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CITY, STATE
CKM335
Also CONCRETE • BITUMINOUS • PLASTER-MORTAR MIXERS

Tractor-Mounted Ripper

■ A tractor-mounted rock ripper for the Caterpillar D8 and D8 pusher crawler tractors is now being produced by the American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif. The hydraulically operated unit is capable of ripping 18 to 30 inches deep with a 9-inch head frame clearance. A three-position pin spacing on standards permits the selection of the desired ripping depth.

The design of the drawbar mounting confines the pulling loads to the drawbar rather than the transmission case and leaves the track frames clear for dozer installation. The ripper standards are curved and tapered for easier penetration and contoured to provide added strength at the points of maximum strain. The average section measures 3½ x 10 inches. The material used is triple heat-treated manganese-moly alloy steel.

This new hydraulically operated rock ripper, made by the American Tractor Equipment Corp., mounts the Caterpillar D8 and D8 pusher crawler tractors.

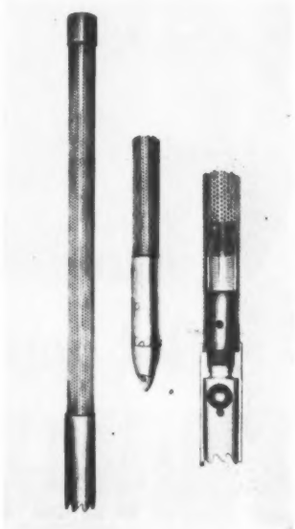
The standards connect to the head frame through swivel-pinned brackets. This swivel action allows them to follow the tractor like a trailer for easier steering. The heavy-duty replaceable rock points on the curved standards shear and roll rocks up and out in the clear back of the head frame. The curved standards create a quivering action that is said to break and shatter rock and shale quickly with less power.

For further information write to the company, or use the Request Card at page 18. Circle No. 123.

Wellpoint Equipment

■ A wellpoint of new design is announced by the Foundation Equipment Corp., 10-11 38th Ave., Long Island City 1, N. Y. The screen assembly of the Freeflow wellpoint has no contact with the inner pipe so that it cannot rust to the pipe.

The screen assembly is a self-contained unit consisting of a fine filtering wire cloth between the inner slotted brass tube and the outside perforated brass jacket. No internal supports of the assembly are necessary to withstand normal lateral pressures encountered in wellpoint work. This construction gives an unobstructed flow area.



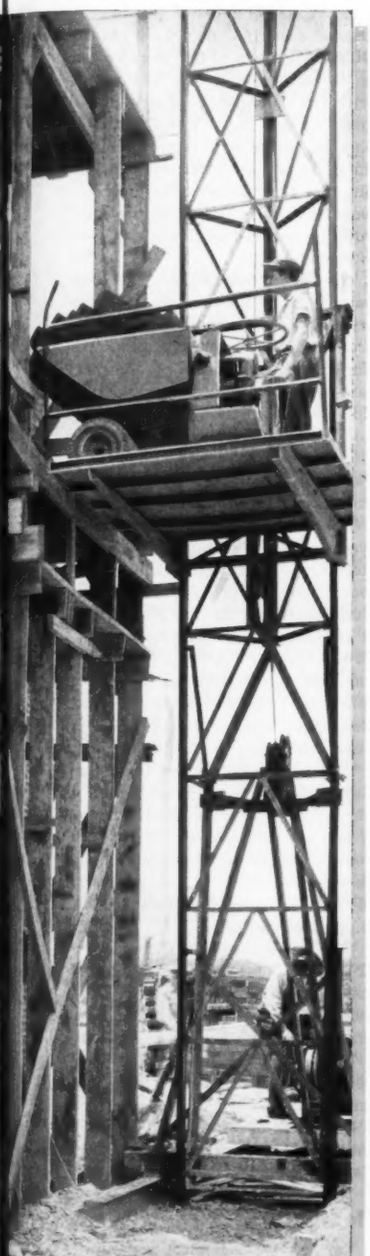
The illustrations show, from left to right, the new Freeflow Wellpoint, a special plug for tough soil conditions, and a cutaway view.

The manufacturer reports that the fine inner mesh screen cannot pull away from the outer perforated brass screen to allow sand or silt to enter during pumping. The wellpoint is dismantled for repairs by unscrewing the jet head and removing the screen assembly.

For further information write to the company, or use the Request Card at page 18. Circle No. 41.

Goodyear Appoints DuPree

The expanding volume of business in the Industrial Products Division of the Goodyear Tire & Rubber Co., Akron 16, Ohio, has brought about the appointment of Sam DuPree as general manager of all industrial products. Mr. DuPree has been with the firm since 1934.



2 MOTO-BUGS, riding hoist elevator, distributed all blocks, bricks, mortar and concrete on Rocky Point, Va. school building (above). "Haven't spent a cent on them in 6 months", says the job foreman. "They're tough buggies — and they have saved us a lot of money and time."

Johnson ⅜ to 3-yard Clamshell Buckets

Smooth inside and out, Johnson all-welded clamshells dig and dump with less resistance . . . give fast clean discharge. They're quick-filling, easy-closing, because big needle bearing-mounted sheaves reduce friction loss, deliver full digging power to cutting edge. Hard manganese edge, welded to heavy lips, toughens with use. 3 types, 10 sizes: ⅜ to 3 yds. Also check Johnson line of concrete plants, bins, batchers, hoppers, silos.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

215 Trenchliner® digs 18 feet per min.

With 30 digging feeds, this cross-country 215 Trenchliner digs 6 in. to 18 feet per min., 13 to 31 in. wide, up to 6 ft. deep. Square or round-bottom buckets have "easy-in, easy-out" Tap-In teeth. Standard tractor-type crawlers have 18-in. treads, lug-type shoes. Other Parsons Trenchliners: wheel-type 202 for drainage and utility work; 3 ladder-types, full crawler mounted; and the mobile, utility size rubber-tired Trenchmobile®.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

Koehring ½-Yd. 205 has 10 or 15-ton lift

On clamshell, dragline, or lift crane operation, you gain an important advantage in extra load capacity with Koehring heavy-duty 205. On crawler mounting, it has 10-ton lift capacity, and boom lengths of 30 to 50 feet. As a rubber-tired truck crane, it safely lifts up to 15 tons. Maximum boom length is 55 ft. Quickly converts to ½-yard shovel or hoe. Three other Koehring sizes up to 2½ yards . . . crane lift capacities up to 79½ tons.

KOEHRING Company
Milwaukee 16, Wisconsin

764

Symons Salesman Named

R. D. Harris has been appointed sales representative in New England and the Hudson River valley for Symons Clamp & Mfg. Co., Chicago, Ill., supplier of concrete forms and accessories. Having completed a training course in the Symons forming system, Mr. Harris is qualified to make estimates, recommendations, and demonstrations.

Buy Direct from Factory!
CONCRETE SMOOTHIE
Concrete Finisher

"Handiest item any concrete contractor can own!"

- Powered by 2 HP gear-reduction Lauson motor
- Adaptable to any width. Pictured here with 12 ft. runners
- Easy back and forth motion does beautiful work

All Machines Guaranteed!

$134.00 F. O. B.

ORDER FROM THIS AD
Dept. CE-2

COLUMBUS STEEL FABRICATING CORP.
COLUMBUS, NEBRASKA

Most recent addition to the Osgood-General line of excavators is this 2-yard Model 920.

Excavator Features Removable Side Frames

■ A new 2-cubic-yard shovel, hoe, dragline, clamshell, and crane combination machine has been added to the line of excavating and material-handling equipment made by Osgood-General, Box 515, Marion, Ohio. A feature of this crawler unit is its demountable side frames with crawlers, tumblers, and side frames designed as a unit. The side frames may be completely removed to reduce the weight when the machine must be transported over the highways, thus eliminating a major rebuilding job when the new work site is reached.

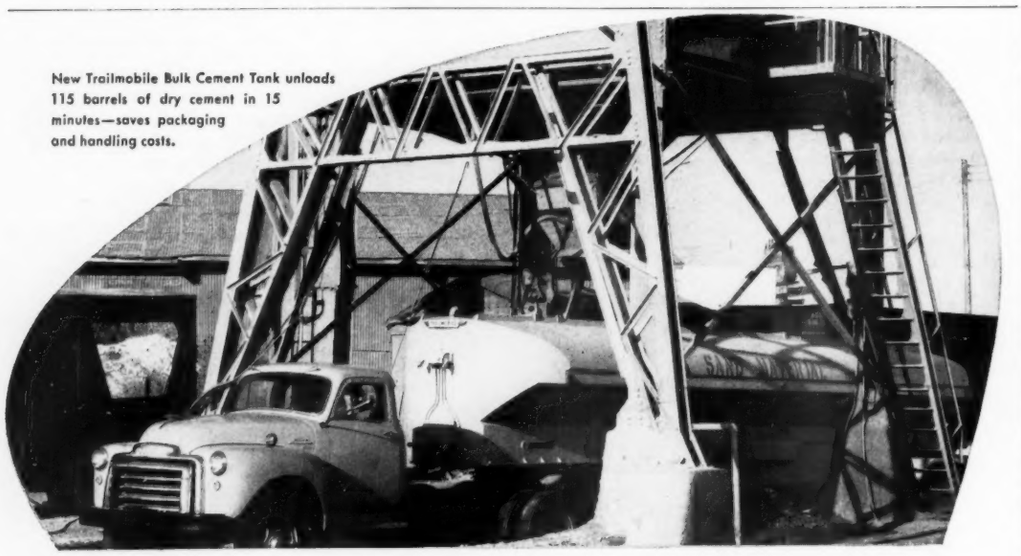
The Model 920 includes the company's Air Tube Clutch, which is reported to give smoothness of operation through metered air power. The machine's deck is of one-piece cast-steel construction. The deck side frames are also of cast steel to hold the horizontal shafts in fixed alignment. The cab gives the operator full vision of his work and protection from the weather.

The standard shovel boom is box-type of high-strength low-alloy steel. It is 23 feet long, with an 18-foot dipper handle. An independent chain crowd, with two-piece chain, is self-adjusting to any boom angle. Crowd and retract sprockets are mounted on the drum in two pieces. Conversion from shovel to other classes of service in the field is rapid and easy.

The all-welded boom for crane, clamshell, and dragline service is of the lattice type with tubular lacing. It may be either flange or pin-connected, with the pin-connected boom designed to fold. Inserts of 5 to 20 feet and jibs of 10 to 30 feet in length are available.

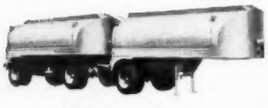
The crawlers are 15 feet long and 12 feet 1½ inches wide over-all, with standard 31-inch treads. Thirty-six-inch treads are also available. The unit's standard engine is the GM 6-71 diesel. Optional torque converters may be added to the power unit.

For further information write to the company, or use the Request Card at page 18. Circle No. 87.



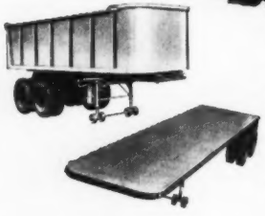
New Trailmobile Bulk Cement Tank unloads 115 barrels of dry cement in 15 minutes—saves packaging and handling costs.

Get your tough jobs done with a
TRAILMOBILE TRAILER



TRAILMOBILE TANK TRAILERS
for water, oil, gasoline, kerosene, asphalt, bulk cement, aggregate, liquid petroleum gas.

TRAILMOBILE STEEL AND CORRUGATED VANS
for loose freight, tools, storage, mobile field office and miscellaneous equipment.



TRAILMOBILE DUMP AND FLAT BED TRAILERS.
Dump trailers can handle capacities up to 25 cubic yards. Flat beds are available in almost any length and capacity for hauling lumber, steel, piping, oversize machinery and concentrated loads.

You'll find rugged, hard-working Trailmobiles on job sites everywhere—hauling materials and supplies for construction of bridges, buildings, roads and dams. They serve as mobile storage units and field offices, too. There's a Trailmobile for almost all construction needs.

Several kinds of trailers may be pulled with one tractor—that means substantial savings.

Check the yellow pages of your 'phone book for address of your nearest Trailmobile Branch, or write:

TRAILMOBILE INC.

The Trend is to TRAILMOBILE

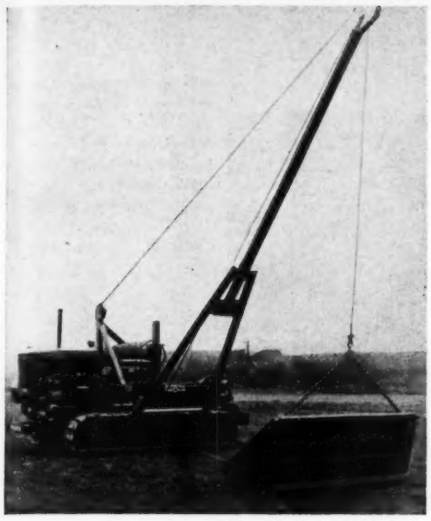
A Subsidiary of Pullman Incorporated

Cincinnati 9, Ohio Berkeley 10, Calif.

Ask TRAILMOBILE—Hundreds of types, sizes and makes of good used trailers available for prompt delivery.

Flexible Steel News

Vertner S. Kenerson is now representing the Flexible Steel Lacing Co., Chicago 44, Ill., in Virginia, North Carolina, South Carolina, and eastern Tennessee. This is part of the territory formerly handled by Austin Webster, who recently retired. Flexible Steel manufactures belt fasteners for joining conveyor, transmission, and V-belts.



The Cleveland Model 190 backfiller.

Booklet on V-Belts

■ A folder on new V-belts is offered by Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J. Nine advantages of the new R-M Super-Power belts are outlined in detail.

The folder claims a 40 per cent increase in horsepower capacity over standard belts, resistance to shock loads, and length stability. A complete list of sizes and new belt numbers is included.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 67.

CAMPBELL DETACHABLE CABS

assure • FULL PROTECTION • FULL VISIBILITY • FULL PRODUCTION on your tractor

With a CAMPBELL DETACHABLE CAB on your tractor, your operator can work in any kind of weather—no work stoppage. All cabs have special, light-weight safety glass used throughout.

You will find a detachable cab available for many types of tractor models. Cabs are handled by your industrial tractor dealer.

For complete information on cabs to fill your needs write:

Campbell Detachable Cab Co.

WAUCONDA ILLINOIS

Heavy-Duty Backfiller Is One-Man Operated

■ A big-capacity backfiller for pipeline and other heavy-construction work is announced by The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 1, Ohio. The new Cleveland Model 190 employs a 7-foot backfill board. The machine backfills as it travels, providing continuous operation under one-man control.

Long wide crawlers give the unit a low ground-bearing pressure of 6.2 psi. The crawler-mounted machine has double-rimmed sprockets, wheels, and rollers and antifriction bearings. Its design eliminates track packing and provides greater stability.

Over-all width of the new machine is 8 feet, not including the boom. Fifteen feet in length and 9 feet 10 inches in height, it weighs approximately 22,500 pounds.

The transmission provides 48 crawler speeds from 1 fpm to 4.3 mph in either direction. The machine is powered by a 467-cubic-inch diesel engine which develops 79 hp at 1,400 rpm. Large hydraulic-actuated clutches with vacuum boosters give the operator control of the big smooth-casting scraper board. Four separate transmission-controlled line speeds are available for both the pull-in and throw-out cables, ranging from 47 to 450 fpm. The 1,000-pound board bites deep into the spoil bank. Both the boom hoist and tow winch are hydraulically operated.

The adjustable boom can be telescoped from 19 to 27 feet. It can be easily removed for an 8-foot hauling width. As a side crane the unit has a 50,000-foot-pound capacity figured from the edge of the crawler, 10,000 pounds at 5 feet out, and 5,000 pounds at 10 feet out. Its spring-cushioned winch-drum hand brake provides steady control for crane work.

For further information write to the company, or use the Request Card at page 18. Circle No. 111.

Hyster Supervisor Named

Thomas R. Hazel has been appointed supervisor of the tractor equipment engineering division of Hyster Co., Portland, Oreg., and Ronald A. Johnson, supervisor of the engineering standards division of the organization.

Field assembly of Monotube piles is quickly and easily accomplished using a "come-along" with two cable chokers.

Driven pile being cut off at proper height. Use of cut-off sections as extensions minimizes waste.

Welding extension to driven base section of pile on right while driving of pile on left continues. No lost time.

How **MONOTUBE PILES** meet the need for

VARIATION IN DRIVEN LENGTHS

UNLESS you've already had first-hand experience with Monotube piles, you might be amazed at how their "easy field extendibility" pays off. Engineers and contractors are taking advantage of it on job after job . . .

Many contractors set up a simple welding rack to do their own field assembly right on the job, thereby furnishing the driver with one-piece piles to approximate required length.

Another procedure is to weld on extensions as driving progresses. While one pile is being extended, driving continues on an adjacent pile. No lost time.

Such practices are completely practical with Monotubes because they combine light weight and easy handling with cold-rolled high strength. Weld-splicing goes easy and fast. No difficult welding operations.

Get the facts on *all* cost-important Monotube features. Write to The Union Metal Manufacturing Co., Canton 5, Ohio.

Monotube Foundation Piles

UNION METAL

Pile driving operations get under way by Raymond Concrete Pile Co. (background). A Koehring crane (foreground) handles materials in the tight working quarters.

New Industrial Hospital for G-E Employees

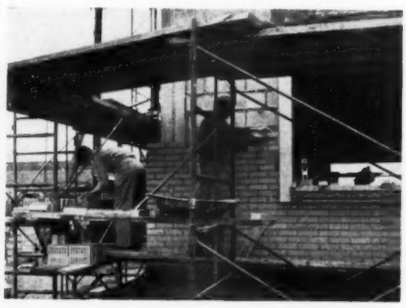
Schenectady plant's two-story reinforced-concrete building is supported on composite piles and faced with brick

By WILLIAM H. QUIRK, Editor

AT THE WORLD'S LARGEST electrical workshop, the Schenectady plant of the General Electric Co., a modern industrial hospital is being erected to serve the needs of 41,000 G-E employees. It is located near the geographical center of the big plant, which contains approximately 300 separate buildings and occupies an area nearly 1½ miles long and ¾ mile wide. The new building will replace an existing hospital that shares a building with the fire station and is now inadequate for the needs of the giant industrial center.

The site selected for the hospital lies just off River Road which bisects the plant. To make room for the hospital, an old pipe shop and adjacent stockroom building were cleared away and facilities provided for them elsewhere. Since industrial hospitals are not too common, architects with design experience in this type of building are in the minority. The G-E Realty Corp., which is building the hospital for the G-E Co., chose York & Sawyer of New York City, an architectural firm experienced in this field, to prepare the plans and specifications. James E. Lowe & Son, Inc., of Schenectady, was awarded the general contract on a competitive bid basis.

Construction got under way on March 15, 1953, and is scheduled for completion this June. The cost of the building and facilities will be approximately $1,200,000. The new hospital will be a two-story brick-faced reinforced-concrete structural frame building, with a penthouse to accommodate equipment for air conditioning and other services. It will have a gross floor area totaling 33,600 square feet, with 18,200 square feet on the main floor, 12,400 square feet on the second floor, and 3,000 square feet in the penthouse. A T-shaped structure, the two-story main portion across the top of the T measures 172 x 72½ feet, and the single-story wing on the south side is 84 feet wide x 69 feet long. The penthouse measures 37 x 85 feet. There is no basement.



Bricklayers, working from Ezebilt Universal scaffolding, started work as soon as the framework took shape.

A workman uses an Eveready Brik-Saw to cut masonry into the needed trim sizes.

G-E Staff Photos

Supported on Piles

The hospital is supported on a total of 355 Raymond wood composite piles, 40 to 50 feet in length, driven to a 20-ton minimum bearing with a Vulcan No. 0 single-acting hammer. All the pile work was done by the Raymond Concrete Pile Co. of New York City. This type of composite pile combines the advantages of the permanence of concrete piles with the low cost of wood piles. The lower section of the pile is of wood with 8-inch tip and 12-inch butt, while the upper section consists of a 12-inch-diameter corrugated metal shell filled with cast-in-place concrete. Because its upper section is made of concrete, the composite pile does not need to be cut off below ground water level. It eliminates much of the costly excavation, sheeting, and pumping often required with all-wood piles.

Piles were driven through a sand and cinder fill that covered this part of the job site, on down through soft, silty sands, and to a bearing in a stratum of coarse sand and gravel. The tops of the timber piles are at ground water level, approximately 215.0 elevation. Driving was done by a mandrel inside the pile shell. When the required bearing was obtained, the mandrel was withdrawn and the shell cut off with a torch at the desired level. The upper section of the pile was then filled with concrete from ready-mix trucks. A watertight joint connects the two pile sections.

Piles for the column footings were driven in clusters of from three to

Equipped with a 75-foot boom, this P&H crane lifts materials to the second floor level of the T-shaped structure.

nine, and the clusters were then capped with concrete. Caps varied considerably in size and shape, depending on the loads. A typical 6-pile cap measured 5 feet x 7 feet 6 inches in area and 2 feet 5 inches in depth. Elevation of most of the pile caps is 222.17. In one section of the building where the mechanical room and service tunnel is located, the excavation was carried deeper. Here the pile cap elevation is 216.0, and the finished floor of the tunnel is 217.5. When ground water was encountered, 2-inch tongue-and-groove sheeting was driven around that particular area and the hole was kept dry with a small pump.

Reinforced Concrete Frame

Following site clearing, some track relocation, and foundation work, the building proper got under way with the pouring of the grade beams and columns. Grade beams are 16 inches in width, lightly reinforced, and come up to the level of the subfloor. They are supported on the pile caps. Column dimensions vary, but the more typical is a 12-inch square column. The floor consists of a 6-inch concrete slab poured on the grade and topped with a 4-inch floor fill of lightweight concrete made with Waylite aggregate. This same construction was used for the second floor and the roofs, saving much dead weight and permitting economies in the design. The roof areas also have a 2-inch covering of insulating blanket, topped by the conventional built-up material.

The reinforced-concrete structure contains approximately 1,640 cubic yards of concrete and 130 tons of reinforcing steel. Both materials came from local Schenectady suppliers. All the concrete, except the lightweight variety, was delivered to the site in ready-mix trucks. The 400 yards of Waylite was mixed on the job site.

Depending on the location of the pour, the concrete was either chuted directly into the forms, discharged into buckets handled by a P&H truck crane equipped with a 75-foot boom, or unloaded into a fleet of three Bell Prime Movers which hauled it away to the forms. These motorized units were also employed for moving various materials about the job site.

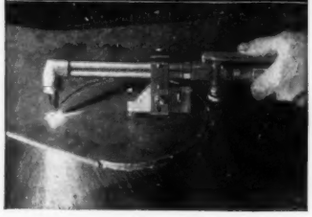
Wood and Metal Forms

Plywood forms were used in the construction of the columns and beams, and metal pans for the joists and slabs of the upper floors. Schedules were such that this form mate-

(Continued on next page)

One of the Bell Prime Movers that handles concrete is rolled out of the building for another load. These units also moved various other materials around on the job.

THREE NEW GUIDES for METAL CUTTING



Now you can accurately, easily flame cut all kinds of shapes — circles, angles, bevels, straight lines. NEECO cutting guides convert ordinary hand torches into precision cutting instruments. Attached quickly — without tools. Neat, clean cuts need little or no grinding or machine finishing. Models to fit all torches, from 70° to 90° types. Cut circles from 1 to 66 inches diameter. Every shop should have these new guides — as basic, time saving tools or as standby equipment.

The new NEECO guides are of three types —for small circles (shown above), for large circles, and for straight lines.

Write for illustrated Bulletin 101 and model selection data.

NEECO Precision Flame Cutting — Fast and Exact!

NEW ERA ENGINEERING COMPANY
458 West 29th St., Chicago 16, Illinois

NOW!

you can get big drill performance with the

CHALLENGER

Blast Hole Drill

HERE'S WHAT USERS SAY:

"Drilling cost per ton of ore broken reduced by two-thirds over wagon drills. Driller experience can further reduce to one-sixth of wagon drilling cost."

"Punched down four 60′ holes, bottoming at 4″ dia., in one shift. What a drill!"

SPECIAL DRILL AND STEEL SERVICE

The size of the Challenger Drill and the sectional steel used with it, makes necessary special drill and steel service which is provided by Joy. Service trucks, like the one shown here, make periodic visits in areas where Challenger Drills are operating. The operators of this "mobile shop" are experienced drill doctors who furnish complete drill steel service, bit sharpening service, drill inspection, and suggestions for use and application of the drill for best results.

Users' reports on early units show that you really get big drill performance with the Challenger Drill. It's a 5¼" hammer drill (not a piston drill) that drills 4½" diameter holes through hardest rock to depths of 50′ or more. This big drill performance calls for a 26′ feed to cut the number of steel changes, and a self-propelled mounting. Tractor-mounted on rubber tires with a portable compressor to furnish air for drilling, the Joy Challenger is the biggest cost-cutting big drill for hard rock drilling. Check your needs . . . see if this big drill won't answer your problems. ● ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

JOY

WORLD'S LARGEST BUILDER OF CORE DRILLS, ROTARY BLAST HOLE DRILLS AND MOTORIZED DRILL RIGS

WBD C 4338

Superintendent William Sutton and Project Engineer Fred Reynolds examine a sample slab of the Waylite concrete which is used for the 4-inch floor fills. In the background is one of the trailers supplied by Contractors Trailer Co. It is used as a portable headquarters.

The hospital will be equipped to handle almost any emergency. Following the current practice, cases of severe injury or serious illness will be transferred to other hospitals after emergency care.

Tight Quarters

Working space in which to erect the new hospital was necessarily limited because existing buildings border three sides of the area, while River Road runs along the front. The work and storage area was also kept confined for security reasons. A high woven-wire fence, thrown

(Continued from preceding page)

rial was re-used several times. Beams average 16 to 18 inches in width and 24 to 38 inches in depth. The joists, which have an average spacing of 16 inches on centers, are 5 inches wide with a depth of 9 inches below the slab. In pouring the upper floors, the contractor supported the forms on Roos shores that were spaced on 4-foot centers under the joists, and on 16-inch centers in the other direction. Concrete with a strength of 3,000 psi at 28 days was called for, but actual tests showed that strength of the mix averaged between 4,000 and 5,000 psi.

As the framework of the building took shape, the masons moved in and took over their part of the job. The excavation, concrete, and masonry work were all done by the general contractor. A total of 126,000 manganese gray bricks is needed to face the hospital. The 8-inch concrete blocks that back up the face brick come to 23,000 square feet. The masonry extends from the ground (finished floor elev. 227.0) to the roof.

The bricklayers worked from Ezebilt scaffolds encircling the building. An Eveready BrikSaw was used to cut pieces of masonry into the needed trim sizes. As the work progressed upward, supplies were hoisted to the desired level by means of a 40-foot-high Chesbro-Whitman materials tower and a Clyde hoist.

On the Inside

The building's floors are of asphalt tile, while ceilings are mostly of acoustical metal pan. Mobilwall hollow steel partitions are used for the interior walls because of their flexibility. They are 3 inches thick and of ceiling height, but are easily moved about to meet changing space requirements. The ceiling height in the rooms is 9 feet 7¼ inches, while in the corridors, it is 8 feet 2 inches.

A garage, being built into the first floor to accommodate two ambulances, will permit direct access to the hospital facilities. The T-shaped first floor will also contain the dispensary areas, operating rooms equipped for emergencies, doctors' offices, and nurses' station. The second floor will have a complete pre-placement service area where thorough physical examinations will be given prospective employees. It will also house a modern industrial-hygiene laboratory equipped to conduct a continuous investigation of working conditions, solvents, acids, dusts, air-borne contaminants, humidity, noise, and conditions brought about by welding, etc.

HYDRAULIC TORQUE CONVERTER WITH UNIDRIVE TRANSMISSION — AN EXCLUSIVE FEATURE ON EIMCO TRACTOR EXCAVATORS

When hydraulic torque converters were first used in heavy prime moving equipment it marked a step forward in tractor design. But now the hydraulic torque converter with the Eimco Unidrive transmission provides the ultimate in heavy tractor drives and the ideal combination for effortless operation, longer life through cushioned load, increased work output and maximum operating efficiency.

The Eimco 105 is the only crawler tractor with the maneuverability permitted by hydraulic torque converter and Unidrive transmission.

This combination of mechanical ingenuity makes the 105, a 17 ton brute, as agile as a kitten. You can dance right, left, forward, backward without stopping to shift, without scraping a track pad.

The Eimco 105 matches all load conditions with exactly the right combination of speed and power and is capable of exerting maximum draw bar pull AT ALL TIMES.

It is the only crawler tractor in which the operator can change gears under full load, on grades or uneven terrain without stopping, losing position or dropping the moving load.

The 105 develops more drawbar pull per engine horsepower than any other tractor.

The 105 is the only tractor designed for the heavy attachments ordinarily used on tractors today. This extra strength built into the 105 is designed to

up around the site, had a gate on the River Road side to admit the contractor's men, material, and equipment. Thus the contractor was not delayed by any checking or inspection, and yet contact with the G-E plant area was cut off by the fence.

Two trailers fitted snugly along one side of the fenced-in enclosure to provide field offices—one for the contractor's key personnel and the other for the engineers of the G-E Realty Corp. Contractors Trailer Co. supplied the portable headquarters which are air-conditioned in the summer and warmed by butane fuel in the winter.

G-E helped the contractor along in his winter work by furnishing steam to the new building from the plant's central steam plant. Vulcan radiation was strung up inside the hospital to permit interior finishing during the cold weather.

The central steam plant will heat the new hospital which will also be air-conditioned by a chilled-water central system. Window units will provide air conditioning to perimeter areas, while a separately controlled air supply will go to the interior areas.

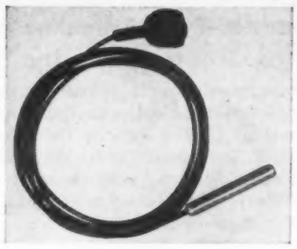
James E. Lowe & Son, Inc., the general contractor, is employing an average force of 120 on the project under the direction of William Sutton, superintendent.

The General Electric Realty Corp. is represented on the project by Fred A. Reynolds, project engineer, and J. C. Stover, resident engineer.

THE END

Pressure-Type Gage Records Water Depth

■ A simple marine depth indicator is made by Aerco Industries. The Subscout's primary function is as a shallow-water depth indicator,



The Aerco Subscout depth indicator.

and the device can be used for underwater charting done from a small boat. Two models available record depths of 25 and 50 feet.

The depth indicator consists of three basic parts. The indicator or head, on which the depth is shown in feet, is a sensitive aneroid-type gage. The line on which the sensing unit is trailed is a coaxial cable composed of an inner pressure line, a supporting hollow steel cable, and a corrosion-resistant plastic covering. The sensing unit is a molded plastic glass-fiber cylinder with a plastic diaphragm.

The operating principle of the device is based on the fact that pressure increases with the depth of water. On its dial, the first six feet of depth are shown in the first 360 degrees of the needle's sweep, and the remaining feet of depth are shown by the second 360 degrees of needle sweep, with the graduations becoming progressively smaller as the depth increases.

For further information use the Request Card at page 18. Circle No. 48.

TH COST SAVING ADVANTAGES

absorb the extra vertical loads into the main frame permitting all auxiliary equipment to be attached to the frame and leaving the tracks free to oscillate on uneven ground.

105s are made of heavy fabricated or cast alloy steel parts throughout. All gearing, bearings and shafts are oversize for years of uninterrupted service. All parts are easily accesible for quick service. Clutches never need adjustment. Timken tapered roller bearings are separately caged in track rollers, idlers and final drives for perfect alignment, accurate fit and long life.

The Unidrive transmission is a compact, complete unit, containing all the gearing and clutches for speed changing and full independent reversal of each track. This design combines all of the best features of constant mesh gearing and hydraulically operated friction clutches with sealed oil bath pressure lubrication of all wearing parts.

The independent control of each track, made possible by the Eimco Unidrive transmission, is another exclusive feature. Two separate final drives, one for each track, have extra heavy alloy steel gearing and extra large diameter shafts. There are no clutches, brakes or gadgets in the Eimco 105 final drives.

The operator of the Eimco 105 sits up front where he can see his work. The controls are easy and convenient. Tractor controls require only one hand with the other free to operate the attachment. Foot pedals have been eliminated for clutching, shifting or turning. Stopping to shift for speed changes or reverse is eliminated.

The Eimco 105 gives you new, low operating and maintenance costs. You get the work capacity of the largest crawler tractor units but with the low initial investment as well as the operating economies previously confined to the smaller tractors.

Eimco 105s offer more exclusive advantages and have improved design and construction features in EVERY part. This is the reason Eimco 105s are increasing output with lower operating and upkeep costs on every job. See this revolutionary piece of tractor equipment before you consider buying anything in the tractor, excavator, shovel or bulldozer line. Write for complete information. The Eimco Corporation, P. O. Box 300, Salt Lake City, Utah.

EIMCO

THE EIMCO CORPORATION
Salt Lake City, Utah, U.S.A.
Export Office. Eimco Bldg., 52 South St., New York City

New Form-Pin Driver

■ A new form-pin driver has been added to the line made by the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. The manufacturer reports that with the Model PB-59 form-pin driver, one man can keep up with the pin setters, driving the pins in from 5 to 10 seconds each. The air-powered tool weighs 50 pounds.

The tool also converts to a lightweight paving breaker for a wide range of demolition, digging, and backfill tamping jobs. Its light weight makes it suitable for use on scaffolding or on any job application where an easy-handling tool is an important requirement.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 5.

Ingersoll-Rand's new form-pin driver, Model PB-59, weighs 50 pounds.

Ladder-Type Trencher Has Greater Capacity

■ Increased bucket capacity with widths up to 16 inches has been announced by the Parsons Co., Box 431, Newton, Iowa, for its Model 88 pneumatic-tire-mounted Trenchmobile. The firm now offers the Model 88 with a choice of three bucket widths: 8, 12, and 16 inches. Other improvements announced by Parsons include a hydraulic boom hoist with positive down-crowd and three-point suspension of the wheels from the trencher frame.

The Model 88 Trenchmobile now digs a trench up to 16 inches wide.

With the increased trench width, the range of usefulness of the Model 88 Trenchmobile has been extended. Trenches for larger size pipes, tile, and conduit systems are now within the operating range of the machine so that a wider range of home and building footings can be excavated. The hydraulic hoisting and lowering of the digging boom provides positive down-crowd in the most severe soils. It also maintains grade quickly and accurately. The speed of raising and lowering can be increased and is now better controlled by the operator than it was formerly.

The simplicity of construction of the hydraulic hoist eliminates many moving parts previously used, as well as many adjustments. The three-point suspension of the wheels from the trencher's frame permits excavating in roadside ditches of uneven terrain. The oscillating action of the steering axle equalizes stress and strain loadings on the unit's frame. The frame is kept level when moving or digging over terrain.

Other features of the Model 88 have been retained. These include travel speeds up to 12½ mph; small dimensions for close-quarter operations; and a sloping ladder-type boom for cutting square corners, undercutting, or making vertical setins against foundation walls. Also retained is the reversible shiftable belt conveyor for depositing spoil to either side, a crumber to assure a clean trench bottom, and a dual-purpose excavator drive and safety clutch. The Trenchmobile has a turning radius of 19½ feet. The wheelbase measures 7¼ feet.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 25.

Hardfacing Alloys Data

■ A line of hardfacing and buildup rods and electrodes is described in a new catalog from the American Manganese Steel Division, American Brake Shoe Co., 389 E. 14th St., Chicago Heights, Ill. Typical applications are shown, and full metallurgical and physical properties are included for the four automatic and 15 manual rods and electrodes.

There is also a complete technical section with charts and photographs presented to help in the selection of the correct hardfacing rod for various wear problems.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 76.

LOW-COST
VERSATILE
HOPTO
GIVES YOU
3-WAY
WORK CAPACITY

DIGGER CRANE SHOVEL

SIMPLE TO OPERATE...FAST CYCLING...200° SWING

There is no longer any need to just wish for a mobile crane, a fast cycling power shovel, with a capacity of 40 cubic yards per hour, a portable digger that can do 'straight-down' digging to a depth of 11'!!! You get them all in the low-cost truck HOPTO. Just mount this completely hydraulic unit on any 1½ ton or larger truck that still runs but which may have been already completely charged off on your equipment inventory! Now you have a mobile Digger-Shovel-Crane with world-famous work capacity *and at the lowest possible equipment investment!*

The simple handling of HOPTO is quickly mastered by any handy man or utility man. Four hydraulic controls are conveniently banked in front of the operator who has unrestricted visibility of work at hand. Hydraulic stabilizers assure a firm loading platform, take weight of heavy lifting off the truck springs.

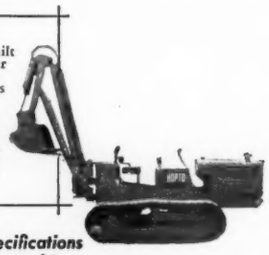
Crane boom is optional equipment, may be equipped with hydraulic control grapple. Backhoe and shovel buckets are available in a wide variety of sizes and designs for material handling and for digging, trenching and excavating in all types of soils.

CHOICE OF MODELS

All the outstanding features of the truck-mounted HOPTO are also available in other models to best fit your needs at lowest possible equipment investment. Self-powered trailer models, power take-off trailer type models and HOPTO units for rear mounting on track type tractors are available in addition to the two models shown.

SELF-POWERED HOPTO UNIT

Model SPC HOPTO is a complete Badger-built unit powered by an MM 206-4A. Other power units can be furnished on request. Unit has a bearing pressure of only three pounds per square inch to permit uninterrupted operation in swampy or muddy soils Comfortable seat for operator swivels for easy access to operating and driving controls. Extremly long reach permits all HOPTO models to work all of a thirty-two foot semi-circle without moving unit.



Write TODAY for complete information and specifications of the HOPTO model that best fits your needs!

BADGER MACHINE CO.
WINONA, MINNESOTA • DEPT. E

cut costs, save time, with the handy

BRUNTON* POCKET TRANSIT

it's easy to carry...
• in your pocket
• on your belt
• in the car

Weighs only 9 oz.—2¾"x3"x1⅛"

Thousands of users have found that much preliminary and supplemental survey work can be done with a Brunton Pocket Transit, making it possible to use their expensive instruments and big surveying crews more efficiently — saving time and money.

*Brunton is a registered trademark of

WM. AINSWORTH & SONS, INC.
2151 LAWRENCE ST. • DENVER 2, COLORADO

The Acker Teredo core drill.

Portable Core Drill

■ A portable core drill is made by Acker Drill Co., Inc., 725 W. Lackawana Ave., Scranton 3, Pa. The Acker Teredo is a medium-capacity drill for depths to 500 or 600 feet. The angle range of the drill is 360 degrees, and the rotative speeds are 200, 450, and 900 rpm.

The drill consists of a combination of a three-speed totally-enclosed transmission with either a hydraulic or a screw-feed drill head. Power can be supplied by whatever type of power plant meets the customer's operating and mounting requirements. A cathead hoist is driven by the transmission, and a power takeoff is provided for driving an integrally mounted positive-displacement pump, if the latter is desired.

For further information write to the company, or use the Request Card at page 18. Circle No. 80.

How to Splice Rubber Transmission Belts

■ An illustrated handbook on how to splice rubber transmission belts by means of the company's belt joint has been published by the B. F. Goodrich Co., Akron, Ohio. The Plylock belt joint is said to end separation by creating a strong, yet flexible, joint without butted outside plies that open at the surface and gradually pull apart.

The new handbook tells how to make the splice, lists tools and material required, and explains how to assemble the splice on the drive. A section devoted to splicing instructions describes and illustrates the procedure for stepping down belt ends, cementing and applying tie-gum, assembling fill-in material, and vulcanizing the splice.

Each step of the procedure is illustrated by photographs. Special instructions are included for splicing folded edge belts, spindle belts, and belts which operate on limited or no-takeup drives. Also featured is a series of convenient tables for figuring endless belt lengths and the time required to vulcanize belting of various thicknesses and types.

To obtain this literature write, on your company letterhead, to the manufacturer, or use the Request Card that is bound in at page 18. Circle No. 16.

Portable Air Compressor

■ A portable 5.3-cfm air compressor is described in literature from the Roberts Electric Co., 849 W. Grand Ave., Chicago 22, Ill. This unit has two independent air outlets, one for high pressure up to 200 pounds, and the other outlet controlled by regulator from zero to maximum. Other features include a large-face gage and a safety release valve. An automatic governor and unloader keeps the pressure constant without stopping the engine.

A hollow frame acts as an air reservoir to give a large supply of oil-free air with no pulsation.

The twin cylinder compressor is manufactured by Bendix-Westinghouse. A 2-hp 4-cycle air-cooled engine manufactured by Briggs & Stratton gives the air compressor its power.

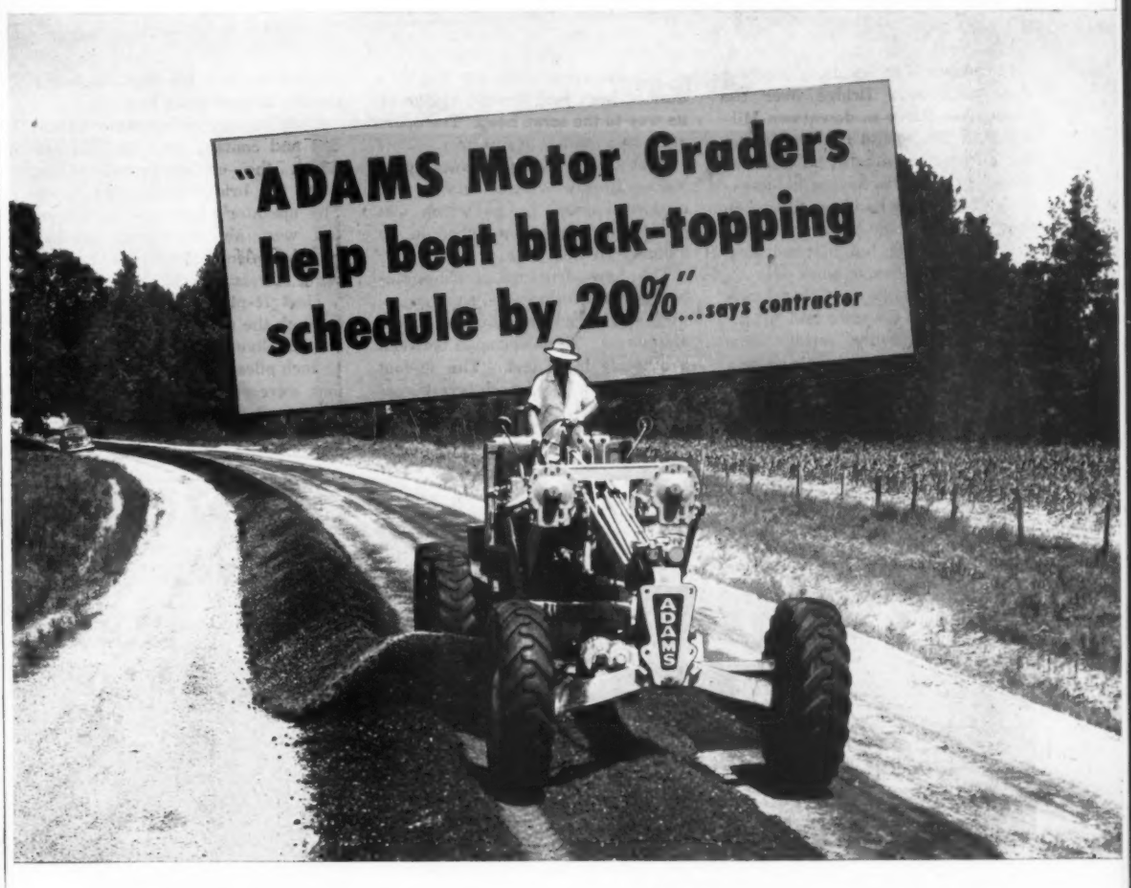
To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 100.

Electric Chain Saws

■ Literature on a one-man electric chain saw is available from the Homelite Corp., 71 Riverdale Ave., Port Chester, N. Y. The saw is shown felling, bucking, topping, and on typical construction work such as bridge building, land clearing, and pile cutting. Three models shown include 14, 20, and 25-inch units. Cutting capacity is up to 3 feet.

The power supply for the saw is the Homelite Carryable generator, a compact and light unit that is gasoline-engine driven. The dual-voltage generator also operates standard 110-volt universal electric tools and flood lights.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 93.



On the job shown above, Freshour Brothers, prominent Arkansas contractors, are using 100 hp. Adams Motor Graders for mixing and spreading 11 miles of black-top.

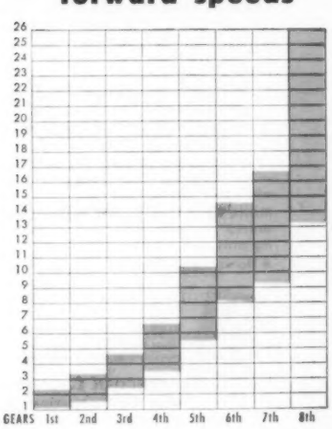
Mr. Dwight Freshour, partner and superintendent, says of these machines, "The power and speed of our Adams Motor Graders helped us complete this job 20% ahead of schedule."

The reason that Freshour Brothers, and other contractors, get this kind of schedule-beating performance is because Adams Motor Graders provide 8 overlapping forward speeds—not just 6, as in most machines. This range gives you an *exactly right speed* to do every type of work at the fastest practical rate. You can do a given job faster or do more work per day. And, you go from job to job faster, too—up to 26 mph.—and that saves productive time.

Let your local Adams dealer demonstrate how these machines will save time and cut costs for you.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.

8 overlapping forward speeds



ADAMS

Motor Graders TravelLoaders Pull-Type Graders

Bascule Bridge Across the Milwaukee River

The No. 56 derrick barge, built by Bucyrus-Erie, swings an 8-ton ball as it demolishes the piers of the old bridge. The rig has a 10-cubic-yard clamshell which it used for underwater excavation.

MOTORISTS WHO regularly used the Juneau Avenue Bridge over the Milwaukee River in downtown Milwaukee, Wis., could not be blamed, one autumn morning in 1952, if they thought they were having halucinations. Everything had been fine when they drove over the old structure the previous evening, but that morning, they found the bridge gone.

During the night, a Great Lakes Dredge & Dock Co. crew had cut the through-truss swing bridge into three sections, loaded the pieces on a barge, and towed them away. By 2 a. m., the crew, with the aid of a derrick boat, had the old bridge on its way to the scrap heap. The operation had started at 8 p. m.

That was the first step toward providing Juneau Avenue with a new modern bascule bridge which was opened to traffic, on schedule, in January of this year.

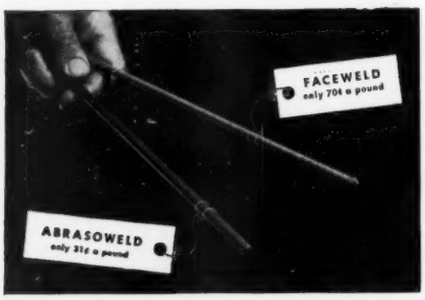
The new structure is a double-leaf bascule with a steel superstructure resting on reinforced-concrete abutments. The clear span between abutments is 94 feet. The 48-foot roadway of open-mesh grating is flanked by two 6½-foot sidewalks, making a total width of 61 feet.

Both abutments measure 71 x 40 feet and contain the large pits into which the counterweights swing when the bridge leaves are raised. The operator's house is located on the west abutment and provides complete electrical controls for lowering or raising both leaves.

Steel H-piles, driven to bedrock through the silty clay subsoil, transmit the live and dead loads. The 10-inch piles, weighing 42 pounds per foot, were driven 45 to 60 feet. Cut-off elevation is 18 to 21 feet below river level.

Great Lakes Dredge & Dock, contractor for the substrutures, used a Bucyrus-Erie steam crane with an 80-foot boom and a McKiernan-Terry 9B3 hammer for driving the H-piles. The same machine drove the sheet-pile cofferdams for both abutments. H-piles for the west abutment were driven without dewatering the cofferdam by outfitting the hammer for underwater operation.

The east cofferdam was dewatered



DON'T BUY HARDSURFACING JUST BECAUSE IT'S HIGH PRICED

THERE'S a notion that a hardsurfacing electrode must be high priced to give proper service. This is not true and here's why:

By proper combination of alloy materials plus efficient, mass manufacturing, Lincoln hardsurfacing electrodes, costing one-third as much money, produce equal and more often superior resistance to impact and abrasion.

1. LINCOLN "ABRASOWELD" sells for about 31 cents a pound.* This is only about one-third the cost of other hardsurfacing electrodes.

2. LINCOLN "FACEWELD" sells for about 70 cents a pound* . . . comparable rods cost $2.60 a pound.

Remember, in spite of these low prices, *you still get high alloy content* in Lincoln hardsurfacing . . . top resistance to impact and abrasion, which means low end-of-service cost. So why pay the high prices?

MAKE YOUR OWN COMPARISON. Try a sample order of "Abrasoweld" and "Faceweld". Your own jobs will prove that hardsurfacing costs can be cut 30 to 50 per cent!

A Hardsurfacing Expert is available in every Lincoln District Office. Ask for him to help solve your problem.

**Prices vary slightly with quantity purchased and geographical location. These prices are for moderate user.*

SEND FOR NEW LINCOLN HARDSURFACING GUIDE
Gives latest data on selecting correct hardsurfacing. Available by writing on your letterhead to:

THE LINCOLN ELECTRIC COMPANY
Dept. 5301, CLEVELAND 17, OHIO

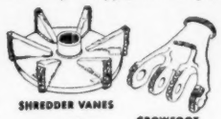
LOOK TO LINCOLN FOR LEADERSHIP
The World's Largest Manufacturer of Arc Welding Equipment

9 out of 10 problems of wear solved with only 2 ELECTRODES

Lincoln "Abrasoweld" . . . a high carbon-chromium alloy for severe impact and abrasion.

Lincoln "Faceweld" . . . has chromium carbide crystals for severe abrasion and impact.

Simplify Your Inventory. Why stock a wide variety of hardsurfacing electrodes? Lincoln's unique "Abrasoweld-Faceweld" combination is ideal for 9 out of 10 hardsurfacing jobs . . . and *saves money on every job,* as for example:


SHREDDER VANES

CROWFOOT

PUMP CASING

DIPPER TOOTH

DRAG CHAIN

PUMP IMPELLER

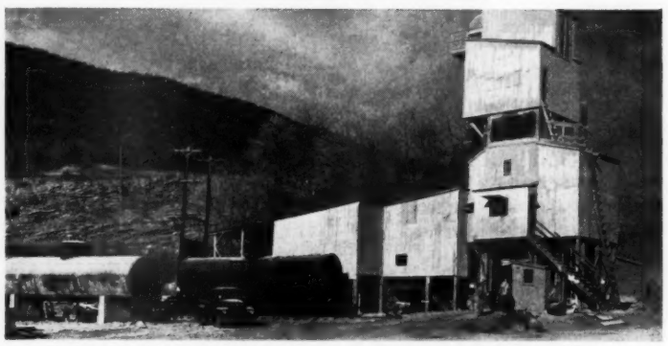
DRAGLINE CLEVIS

SPROCKET

CUTTER HEAD

WORM

MODERNIZE your Asphalt-plant HEATING



The HOT OIL HEATER* SYSTEM gives you these important advantages

1. No traps — no rust — no freeze-ups
There's no steam or water in the HOT OIL HEATER* system — the pipes and heater coils contain only high-grade heat-transfer oil. So cold weather can't bring costly plant shut-downs.

2. Unsurpassed safety
The HOT OIL HEATER* system gives you temperatures up to 400F *at atmospheric pressure;* there are *no high-pressure lines* in this system.

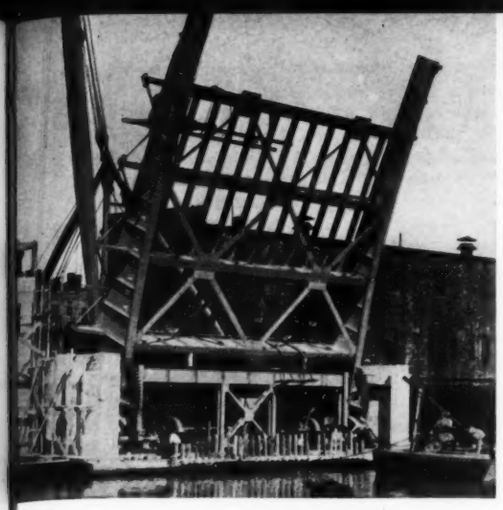
**Patents applied for.*

3. Fully automatic operation
You can heat any part of the system — storage tanks, tank cars, or trailer tanks — independently or all at once, during just the hours you want to operate. A single HOT OIL HEATER* gives you this efficiency with individual circulators for each function or with a single circulator and solenoid valves.

In the plant pictured above, the tank cars — as well as the entire asphalt plant — are being heated by the HOT OIL HEATER* system.

Four sizes of HOT OIL HEATER* meet all your asphalt-plant requirements. And we have larger central stations — up to 30,000,000 BTU per hour — for refineries. Write or telephone us today for detailed information on how you can modernize your asphalt plant with a HOT OIL HEATER* system. Our new manufacturing facilities assure fast service and deliveries.

HOT OIL HEATER DIV.
MOUNTAIN STATE FABRICATING COMPANY
P.O. Box 1146, Clarksburg, West Virginia



The structural steel sections of the two bascule leaves were assembled in the raised position. This is a view of the erection process on the west abutment. The steel was fabricated by the American Bridge Co.

The cofferdam for the west abutment is shown in the center. Sheet piling to protect the railroad tracks is driven (far left) by a Bucyrus-Erie steam crane with a McKiernan-Terry 9B3 hammer.

to approximately the pile cutoff elevation, and the H-piles were driven dry. The cofferdams are constructed of MZ38 sections and have been left in place as a permanent part of the structure. They are connected to the adjacent dock structures on the shore.

Concrete Placed by Tremie

When the cofferdams were completed, they were dewatered to about 16 feet below river level, leaving approximately 10 feet of water. To guard against a possible blowup of the bottom, a 3-foot seal of concrete was poured before the remainder of the wall was removed. This concrete, like all concrete in the structure, was poured by Universal Construction, Inc., Milwaukee, under a subcontract with the Great Lakes firm.

Two hoppers, supported on timbers over the cofferdam, were supplied with concrete from ready-mix trucks. Flexible canvas and rubber tremies carried the concrete from the hoppers to the bottom of the excavation. Tremies were carefully worked around the channels formed by the Z-shaped sheathing members so as to completely fill the spaces. The hoppers were moved along the cofferdam as the pour progressed. The 350-cubic-yard operation was completed in 10 hours.

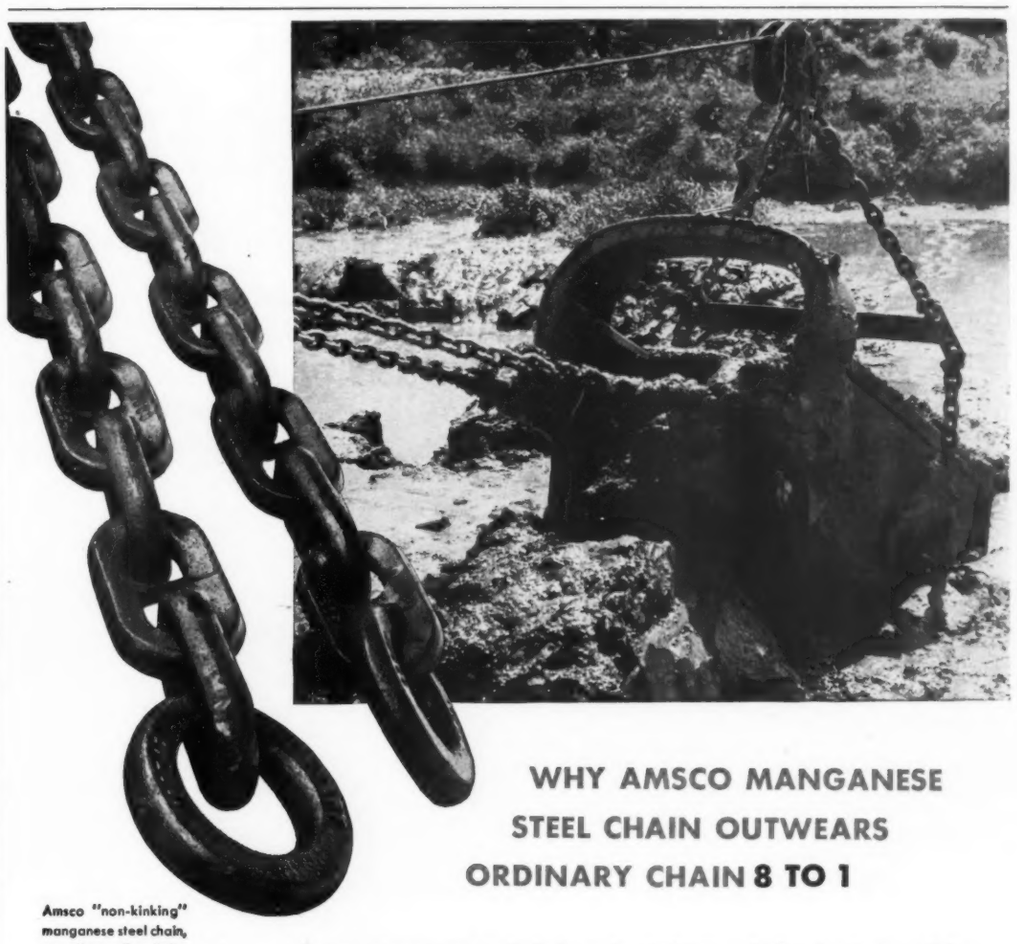
Forms for the succeeding concrete pours were constructed on the job using ¾-inch plywood on 2 x 6 studs with double 2 x 6 wales. Wall forms were tied with twin-rod Superior ties.

In the lower forms, the concrete was chuted directly from ready-mix trucks. At higher elevations, wheelbarrows were used to place the mix, with a hired truck crane and buckets serving forms not otherwise accessible.

Approximately 6,000 cubic yards of the six-bag 3,000-psi concrete went into the structure. Pours of 700 and 750 cubic yards were made in 12 and 14-hour days respectively. The Kolinski Concrete Co., Milwaukee, supplied the ready-mixed concrete.

A separate contract was let to the Julius Theilacker Co., Milwaukee, for the steel superstructure. Mechanical and electrical equipment were included in this contract. The steel was assembled with the bascule leaves in the vertical position. The contractor set a bridge derrick on the sand fill of the bridge approach

(Concluded on next page)



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Amsco manganese steel chain resists impact and abrasion, because it is cast from the toughest steel known. Each link has extra metal on the link sides and ends where most of the abrasion occurs.

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It has special link design to help keep abrasives out of the link-bearing area, thus materially extending service life and minimizing repairs and down time.

It is designed for specific jobs. A complete line of carefully designed Amsco manganese steel chains are available for dragline, bucket elevating, clinker drag, logging, etc.

Don't buy just any chain . . . specify Amsco manganese steel chain made from the toughest steel known. For information, write Amsco Division, Chicago Heights, Illinois.

AMERICAN Brake Shoe

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

(Continued from preceding page)

and assembled the complete leaf, including the counterweights. The roadway grating was placed with the leaf in the horizontal position.

Counterweights consist of reinforced steel boxes filled with heavy concrete. Steel punchings were added to the mix in the amount necessary to obtain the desired weight. In this case, the mix contained 33 pounds of rivet punchings per cubic foot and weighed 175 pounds per cubic foot. Each counterweight contains approximately 2,000 cubic feet of concrete and weighs about 175 tons. For future balancing, 16-inch cubes of concrete with countersunk handles can be added to or removed from counterweight pockets to compensate for weight changes during the life of the structure.

The operating mechanism of the bridge consists of two 25-hp electric motors with reduction gears and electrical controls for each leaf. Motors operate on 240 volts, 60 cycles ac at a rated speed of 1,200 rpm. Operating machinery weighs approximately 80 tons.

To protect the structure from damage by collision with boats or other floating objects, four heavy fender cells were installed at the projecting corners of the abutments. Each cell is made up of a sheet pile ring filled with stone and concrete and surrounded by a row of treated timber piles.

Steel sheet piling, section MP112, was crimped 20 degrees and driven to form a cell 92 inches in diameter. The 45-foot sheets were driven about 17 feet into the river bottom and cut off at 4 feet above normal water surface. The McKiernan-Terry 9B3 hammer was used to drive these cells.

Immediately outside the steel cells, a ring of treated timber piles 45 feet long was driven to the same elevation. Timber piles were driven by a Super Vulcan steam hammer handled by one of the derrick boats. To bind the timber piles tightly together against the steel cell, two bands of ½ x 8-inch steel were drawn snugly around the piles and bolted securely together.

The inside of the steel cell was then filled with 3-inch crushed stone to within 6½ feet of the top, and the balance was filled with concrete. A double row of anchor piles was also driven along each exposed side of the abutment. Each row consisted of 22 piles 45 feet long joined with 8 x 16-inch treated timbers and tied with 1¾ and 1½-inch anchor rods. The top 4 feet of the anchor piles was creosoted.

Juneau Avenue crosses the Milwaukee River in the heart of the brewing district. Railroads occupy the area close to the river's edge on both sides. Even though the area was relatively inactive during some of the construction period due to the prolonged strike of brewery workers, it was impractical to construct the substructures with equipment standing on the banks.

Great Lakes Dredge & Dock Co. used several pieces of floating equipment including their M1 and No. 56 derrick boats, tenders, and barges. The M1 is a company-made revolving crane permanently mounted on a 30.5 x 87 x 6-foot scow. The crane, with 76 feet of boom, is operated by an American three-drum hoist driven by steam engines and is rated at 10 tons.

Number 56 is a diesel-electric crane of a 120-ton capacity. The derrick was built by Bucyrus-Erie and is operated by a 360-hp Fairbanks-Morse diesel generating set. The hull, which measures 165 x 35 x 12 feet, was constructed by the Manitowoc Ship Building Co. The rig broke up the old concrete abutments using an 8-ton breaking ball. With a 10-yard clamshell bucket, it excavated for the abutment footings and the necessary channel excavation.

Personnel

Plans for this bridge were made in Milwaukee's Department of Bridges and Buildings of which George Ashton is superintendent. T. A. Nicholson was chief inspector for the city. For Great Lakes Dredge & Dock Co., E. C. Bowen is manager of the Milwaukee division; Carl Felitan is division superintendent; James Fisher was job superintendent; and Don Lewin was field engineer.

For Universal Construction, Inc., on the concrete placing, Henry Pasenhofer was general superintendent, and Carl Waite was job superintendent. J. C. Theilacker of the Julius Theilacker Co. supervised the erection and assembly of the steel superstructure. THE END

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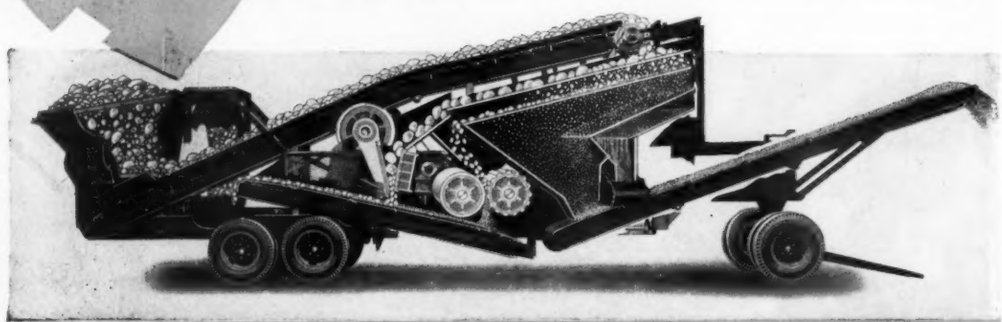

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Plate Feeder	19"	19"	25"	25"
Weight	28,600#	44,500#	55,950#	59,600#
Under Conveyor	18"x10'	24"x14'	30"x18'	30"x19'
Feed Conveyor	20"x23'	24"x26'	30"x29'	36"x34'
Delivery Conveyor	24"x18' Front Discharge Folding	24"x20' Front Discharge Folding	30"x21' Front Discharge Folding	30"x24' Front Discharge Folding

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The new line of Le Roi Transo mixers, offered in sizes ranging from 3 to 6½ yards, features a direct drive that eliminates heavy ring gears and sprockets.

Transit-Mixers Feature Improved Drum Drive

■ A wide range of new mixer and agitator models for truck or skid mounting are offered by the Transo Division of the Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis. The new mixer line ranges from 3 to 6½ yards in capacity. Performance advantages claimed are superior mixing action due to improved blading, ease in handling, faster charging, speedy discharging, shock-free starting, and ease of reversal of drum rotation with full load. A patented drum drive with planetary reversing transmission is also a feature of this line of mixers.

Transo mixers and agitators are designed with spring-loaded clutches running in oil, dual mixing and agitating speeds, dual discharge speeds, and direct mixer drive. The mixers weigh up to 1,000 pounds less (dead weight) than similar models, according to the manufacturer.

Heavy exposed chains, ring gears, sprockets, and bevel gears are eliminated. Other features of the mixers are built-in centrifugal water pumps, flexible suspension of the mixer, good accessibility, and the use of heavy-duty industrial-type engines.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 89.

Infiltration Eliminated By Freezing Drill Point

Freezing the perforated chemical-injection drill point used in soil stabilization work has eliminated the infiltration of sand into the drill point, according to Soil Testing Services, Inc., 3529 N. Cicero Ave., Chicago 41, Ill.

Injection of chemical mixtures to stabilize and decrease the permeability of sand and silt soils is a process that is growing in popularity. However, it poses the problem of preventing sand from entering the drill point as it is driven to the required depth. Dry ice has provided the solution.

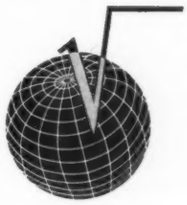
First, the injection section of a drill rod is placed in a section of pipe casing and surrounded with crushed dry ice. After the section of casing is completely frosted, the drill rod is filled with water which is allowed to freeze. Then, the drill rod is placed in the drill for driving. When the drill rod descends to a position below the water table, warm water is pumped into it to melt the ice. Finally, the chemical solution is pumped in to stabilize the soil.

Baker-Raulang Elects

William A. Bauer has been elected president of the Baker-Raulang Co., Cleveland 2, Ohio, manufacturer of industrial cranes and trucks. Concurrent with his election was the appointment of Charles N. Sumwalt, Jr., as executive vice president of the Baker-Raulang organization.

Mr. Bauer, who has been board chairman since October, 1951, is now both chairman of the board and president. He succeeds James W. Moran who retired earlier this year. Mr. Sumwalt was formerly vice president in charge of the company's eastern sales division.

What Is Your Subsurface Problem?



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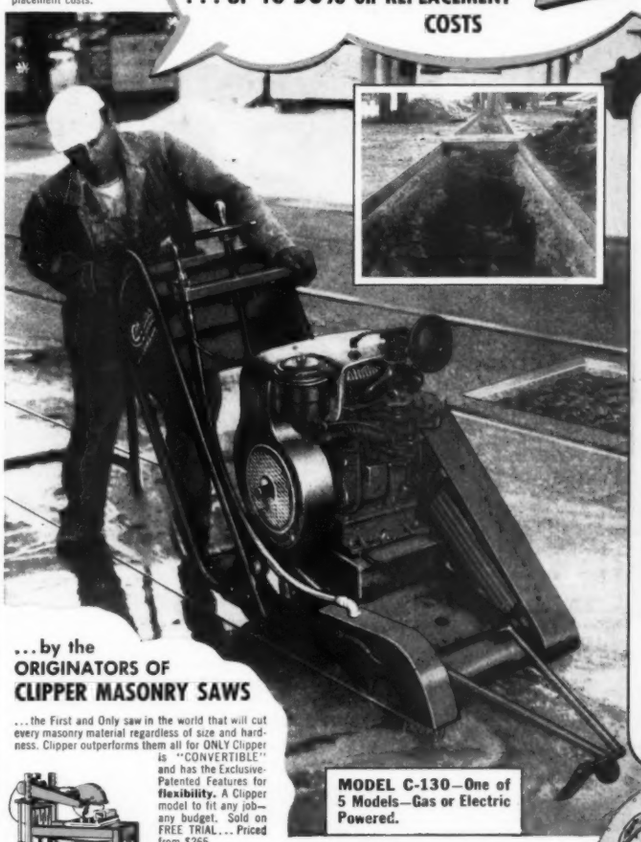

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These asphalt-plant mixer tips were compared for wearing qualities in regular job runs. Tips at left are of Cumzite, while the tip at right is made of a new longer-wearing alloy, Thermalloy HC 250.

Longer-Wearing Alloy Used for Mixer Tips

■ Asphalt plant mixer tips of a longer-wearing alloy are now available for Cummer asphalt plants. The new material used is Thermalloy HC 250, developed by the American Brake Shoe Co. Before adopting it, Cummer tested the alloy under job conditions to determine the extent of its ability to withstand the hard wear the mixer tips, revolving at high speed in a continuous flow of aggregate, must take.

The accompanying photograph shows three paddle tips that were subjected to regular production runs in the Cummer asphalt plant of Ward Pavements, Inc., at Haverstraw, N. Y. The center and left tips are made of Cumzite, a hard-wearing alloy of which mixer tips have been made for a number of years. These two Cumzite tips had seen 18,000 tons of mixing duty at the time the comparison was made. The right tip, made of the new Thermalloy HC 250, had reportedly churned through 42,000 tons of abrasive material.

Among advantages of using the improved mixer tips, as pointed out by the manufacturer, are reduction in down time and in repair costs. The contractor is also relieved of the need to stock a large supply of replacements.

For further information write to the F. D. Cummer & Son Co., 1827 E. 18th St., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 90.

Data on Solidifying Soils Through Chemical Means

■ A soil stabilization service that is used to solidify either dry or water-bearing soils by chemical means is described in literature from the Manu-Mine Research & Development Co., P. O. Box 167, Reading, Pa. To solidify soils, two chemical solutions are injected consecutively through specially perforated steel pipes, air driven, to a length depending upon the material to be treated. When the two injected solutions come in contact, a silica-acid gel immediately precipitates and penetrates into the strata to form a sandstone-like mass impervious to water. Bearing capacity of sandy soil can be increased up to 65 tons per square foot, according to the test. Maximum depth of injections, with present equipment, is unlimited. The ever increasing hardness depends upon the composition of the soil, the proper balance of gel-forming agents, and other factors.

A preliminary laboratory analysis of the soils to be treated is generally performed by the company to determine the effectiveness of the process and the balance of chemical content. Geological and local conditions must be favorable for good results.

Among applications of the process described in the literature is soil solidification in highway construction across fluid terrain. The procedure is also recommended for foundations that are settling because of weight and low bearing value. These may be strengthened permanently by solidifying the soil in place and without excavation. Fluid conditions around piling can be controlled by sealing off the water with rings of solidified soil.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 91.

Detachable Rock Bits

■ Literature is available on a new series of carbide-tipped detachable rock bits which will be added to the Coromant drill-steel line, according to Copco Pacific, Ltd., 930 Brittan Ave., San Carlos, Calif. The new bits will be available in diameters ranging from 1⅜ to 4 inches. They are made with a new carbide insert and a special Swedish steel used in the skirt and body of the bit.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 18.

Lehigh Steel Names Murphy

Edward A. Murphy has been named sales manager of the Lehigh Structural Steel Co., Allentown, Pa., to succeed Leo I. Bruce, who has retired after more than 33 years with the company. At the same time, Carlton K. Reinsmith was made assistant to the sales manager upon the retirement of Mrs. Anna B. Ritter from that position.

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Sonotube Fibre Form being placed in position during construction of Pierce and Phelps Co. building, Philadelphia, Pa. Robert E. Lamb Company—contractors.

(photo by E. Troiani)

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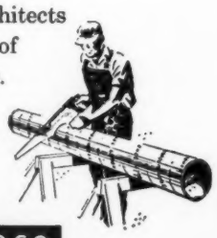

For complete technical data and prices—write

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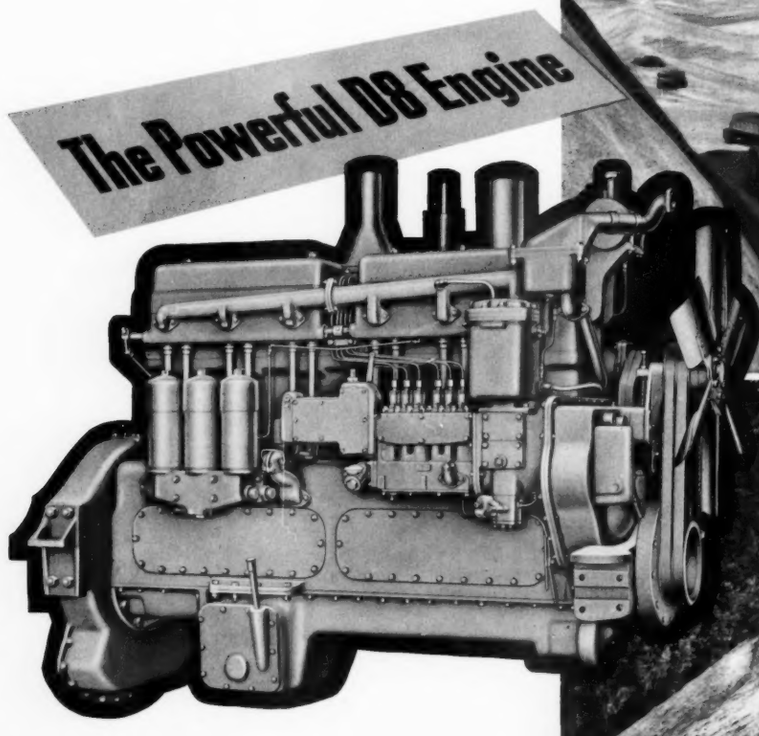
This powerful engine, with these and many other advanced features, is one of the big reasons why the D8 gives you more value than ever before.



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Only Caterpillar offers you the long life and low maintenance cost of the oil clutch. The outstanding feature of this advanced clutch is that oil films absorb the friction and heat. The metallic friction surfaces do not come into contact until the last revolution or two before engagement. The clutch has its own lubrication system with gear-type pump and suction screen. The pump supplies oil under pressure to the hydraulic booster, which makes the clutch exceptionally easy to operate. Oil is also delivered to the inner diameter of the three clutch plates. This continual lubrication and cooling is the principal reason for much longer periods between adjustment and replacement than is possible with the conventional dry clutch. The oil clutch is another big reason why the D8 is a better buy.

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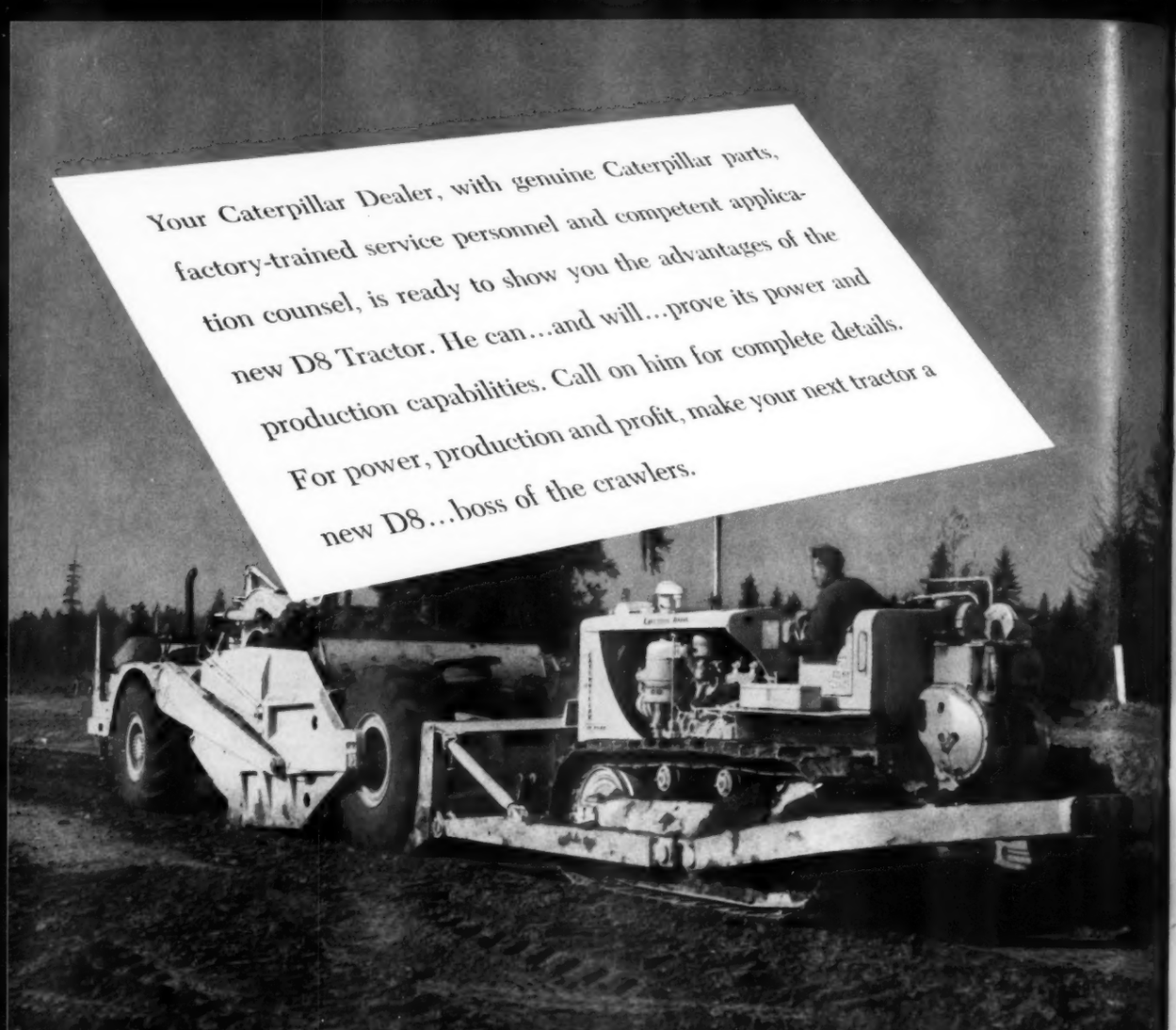
Your Caterpillar Dealer, with genuine Caterpillar parts, factory-trained service personnel and competent application counsel, is ready to show you the advantages of the new D8 Tractor. He can...and will...prove its power and production capabilities. Call on him for complete details. For power, production and profit, make your next tractor a new D8...boss of the crawlers.

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The new Caterpillar D8 Tractor offers new highs in earthmoving production in push-tractor operations. The D8, equipped with No. 8S Bulldozer, heavy duty track roller guards, crankcase guard and tandem pusher frame, will cut your work cycles to a minimum.

Fast and maneuverable, the D8 applies a full 150 HP to the job of loading your hauling units in new record times. Push-loading, singly or in tandem, is provided to meet the conditions of your job.

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Lightweight Hoist Attaches to Ladders

■ A ladder hoist that can be mounted on any ladder up to 40 feet is offered by Reimann & Georger, 280 R & G Bldg., N. Division at Ellicott, Buffalo 3, N. Y. The hoist handles loads up to 100 pounds, but weighs only 80 pounds so that it may be moved easily from one position to another.

The mechanism consists of a motor connected with a V-belt to a drum with a capacity of 125 feet of ½-inch manila rope. When this hoist is mounted on an auxiliary hoist stand or tubular scaffold and wire rope is substituted, the capacity is increased to 200 pounds. Both electric and gasoline motors are available for the unit.

The load is raised by a control lever. A brake automatically holds the load in position. By releasing the brake, the load can be lowered at any desired speed. The manufacturer points out that any laborer can operate this hoist without previous experience.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 14.

Truck-Type Road Planer

■ A line of pneumatic road planers that attach beneath a truck are illustrated in literature from the Pneu-Hydro Road Machinery Co., Cadillac, Mich. The Pneu-Hydro road planer, taking advantage of a truck's natural speed, will smooth and seal 90 to 120 miles of road surface per day, according to the text. It is readily adaptable to shoulder maintenance, light grading, and snow and ice removal. Two of many specialized applications listed are pit road maintenance on a gravel truck's regular run, and cleanup operations behind the V-type snowplows.

The planer is available in heavy-duty 10 and 12-foot sizes and in a lighter 9-foot length. The Model D planer features pneumatic operation and is unaffected by temperature changes. Control is through dashboard-mounted valves. The moldboard is ½ inch thick and 14 inches wide. A large air cushion protects the truck frame from road shocks. A similar unit, the Model H, has 3½-inch hydraulic cylinders for power and is mounted on trucks carrying hydraulic pressure systems.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 104.

Nordberg Promotions

Jack B. Bond has been made assistant general manager of the crusher, screen, and process machinery division of the Nordberg Mfg. Co., Milwaukee, Wis., while Howard M. Zoerb has been appointed to the post of divisional consulting engineer for the division.

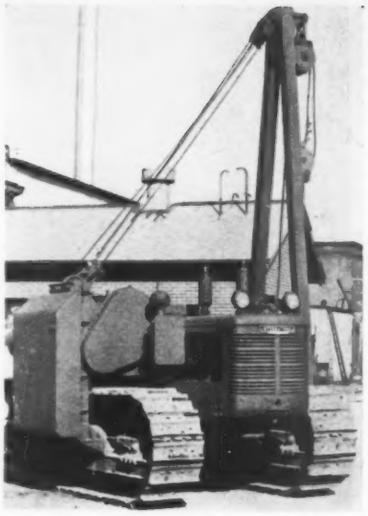
Mr. Bond joined Nordberg in 1944 as sales engineer and became division sales manager in 1951. Mr. Zoerb, who has been with the Nordberg organization for more than 30 years, was formerly administrative manager for the division. He replaces Oscar Gruender who retired recently.

Thread-Repair Kit

■ A thread-repair kit for use in repair shops of construction companies is offered by the Heli-Coil Corp., 1476 Shelter Rock Lane, Danbury, Conn. All tools necessary for the wire insert method of thread repair —four taps, four inserting tools, and an insert extractor—and 25 inserts in each of four commonly-used sizes are included in the No. 34CS kit.

A printed direction sheet glued to the inside of the cover gives full instructions for installation of the inserts. This method of thread repair requires three steps: drilling out the damaged threads, retapping, and installing the insert which brings the hole back to the original size.

For further information write to the company, or use the Request Card at page 18. Circle No. 71.



A new line of pipe booms is announced by the Superior Equipment Co., Box 30, Bucyrus, Ohio. The four models of pipe booms, which are matched to International Harvester crawler tractors, are capable of handling loads up to 90,000 pounds. New features are: increased lifting capacity, more accessible operation, antifriction bearings, and a more compact design for lower maintenance costs. For further information write to the company, or use the Request Card at page 18. Circle No. 23.

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GTD-300 TRENCHDRIL — Used in combination with a CP Compressor and a side boom tractor, the GTD-300 Trenchdril is an ideal time saver when ditching for gas or oil transmission lines. Handles six foot steel changes fast and efficiently. Powerful feed, strong rotation and a steady air blast that speedily gets through to solid rock afford maximum penetration.

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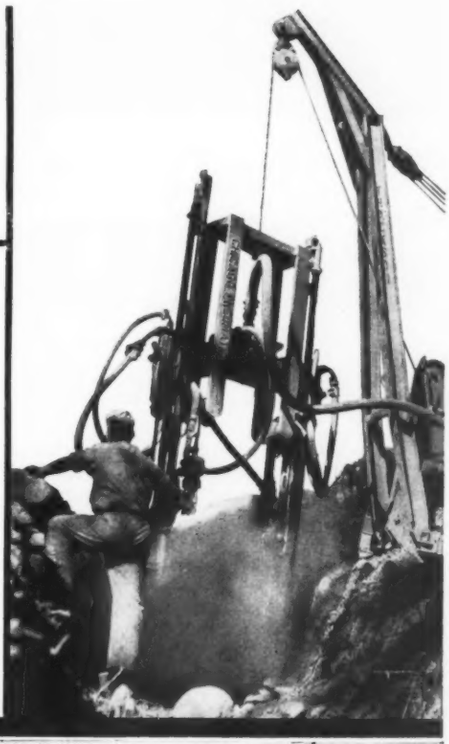

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Working behind protective steel sheet-pile cell-type cofferdams, a P&H shovel loads out rock from the rough powerhouse excavation at The Dalles Dam in Oregon.

Multipurpose Dam For the Northwest

Structure at The Dalles, Oregon, on the Columbia River, will be 8,750 feet long; will provide 1,122,000 kw of power

By RAY DAY

ANOTHER LINK in the chain of hydroelectric installations in the northwest is being forged at The Dalles, Oreg., 100 miles north of Portland. When it is completed, sometime after 1960, it will contribute 1,122,000 kw and will rank among the nation's largest power plants, generating much-needed electricity for the industrial centers at Portland and Vancouver, Wash. The new structure will also bridge a gap in Columbia River navigation that has been a problem since before the Civil War.

Plans call for the construction of a dam, a powerhouse, assorted channels, several bridges, and a modern 675-foot-long navigation lock. In addition, 38 miles of Spokane, Portland & Seattle & Union Pacific railroad track will be relocated, along with 16 miles of U. S. 30. To preserve the important salmon industry of the river, fish ladders, too, will be built. Sponsored by the Corps of Engineers, the huge project carries a $350,000,000 price tag.

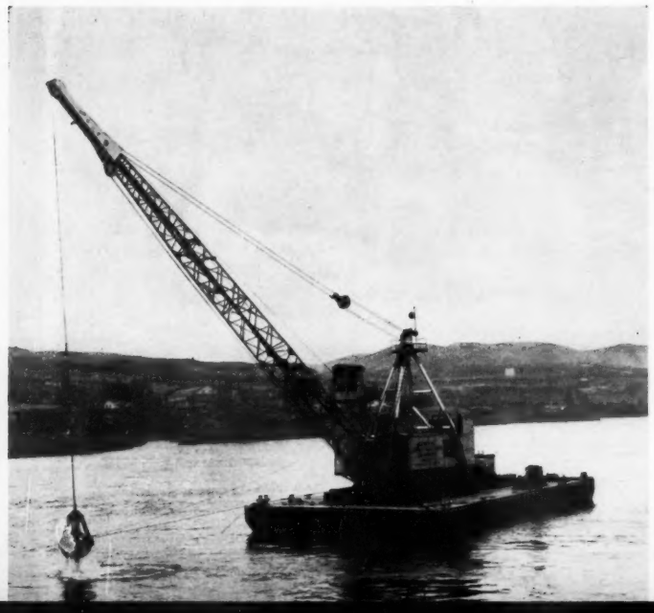
Financing of the undertaking rests on continuing appropriations from Congress. Thus far, funds have been provided for five major contracts. If current progress continues, the Corps of Engineers expects to install a pair of 15,000-kw generators in November, 1957. By 1960, installation of a 14-unit bank of 78,000-kw generators will have been completed.

Aids Columbia Navigation

Although its power production overshadows The Dalles Dam's navigational importance, the structure represents the fourth principal stage in the development of navigation on this section of the Columbia River. River traffic has been able to operate above and below the site of the dam, but the turbulent section between Celilo, Oreg., and The Dalles has always interrupted the traffic flow.

The first connection between the two points, used before the Civil War, was an old wagon-road portage on the Oregon bank. In 1863, the Oregon Steam Navigation Co. completed a 13-mile iron-railed portage along the route of the wagon trail. Increasing river traffic brought about the construction of The Dalles-Celilo Canal in 1915. The single-lift navigation lock, which is planned as part of the dam project, will render the canal obsolete; its final important task will be to transport river traffic during the construction period.

Structurally, The Dalles Dam will be 8,750 feet long. It is located at the head of the Bonneville Dam



Blasted rock is dredged away from the outboard tailrace area by this floating American derrick rig, equipped with an Owen orange-peel bucket.

Crews of the S. A. Healy Co., White Plains, N. Y., work with jackhammers powered by a Worthington compressor as they prepare for a blast in the powerhouse area.

pool nearly 200 miles above the mouth of the river. It will include a concrete gravity overflow, a 23-gate spillway, a powerhouse with a capacity of 16 generators and skeletal substructure for eight additional units, a rock fill closure section across the main river channel, cofferdams, the aforementioned fish ladders, and the necessary appurtenant structures. The entire project will be constructed without diverting the river from its present deep channel.

Specifications

The navigation lock will be 86 feet wide and 675 feet long. A minimum of 15 feet of water will be provided over the sills at maximum drawdown of the reservoir pool. The normal 87½-foot single lift of the lock makes the structure one of the most impressive along the river. There will be a 25-mile slack-water pool above the structure.

The gate-controlled spillway, 125 feet high, will pass the Columbia's worst flows, accommodating 2,290,000 cubic feet per second. Water passing through the two 15,000-kw generators will go on to supply the system of fish ladders.

One of the first stages of the project consisted of the rough excavation for the powerhouse and the construction of a steel sheet-pile cell-type protective cofferdam along the river's normal bank. This was part of a $5,250,000 contract awarded to the S. A. Healy Co., White Plains, N. Y. Started in February, 1952, the job was recently completed.

The spillway construction job was the second major contract item. It went to the Guy F. Atkinson Co. and the Ostrander Construction Co., both of Portland, Oreg., as a joint-venture combine. Included in the $14,500,000 contract is excavation of approach and tailrace channels, construction of two major cofferdams, and a steel pile interconnecting structure between cofferdams. These cofferdams and cells will protect the work areas during the high river stages.

Powerhouse

The powerhouse work is so tremendous, it has been divided into three stages. Phase I is a $30,000,000 contract covering construction of the intake and power-plant substructures, the fishway turbine bay, and the assembly bay of the powerhouse. A joint venture known as The Dalles Powerhouse Constructors, made up of nine firms, has this contract.

Other contracts now under way include the construction of a 1-mile railroad shoofly for the Spokane, Portland & Seattle railroad. This work is being done by G. D. Dennis & Sons, Portland, Oreg. Sometime after the navigation lock is completed, a main-line relocation of the railroad will be made.

Healy's contract called for the rough excavation of the powerhouse site, the construction of a 36-cell steel-pile cofferdam, the construction of two earth-and-rock cofferdams, and for other miscellaneous work. The excavation was of two types: dry and underwater mucking. The 2,220,000 cubic yards was unclassified. For practical purposes, it was all rock and had to be drilled and shot.

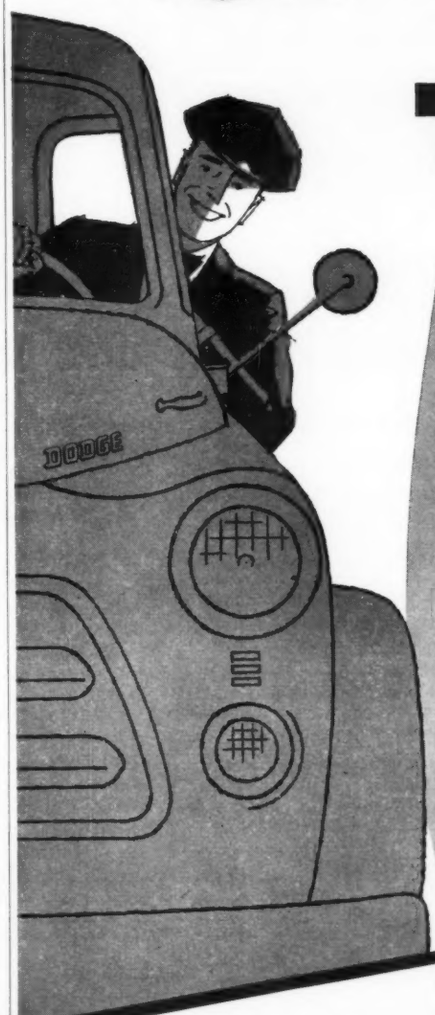
A considerable amount of blasting and excavation was necessary to level the site for the steel pile cofferdam, which was located just outside the powerhouse limits on the river side. Excavation at this point was such that there will be little or no rock blasting to do when the cofferdam is removed after the powerhouse is completed.

Drilling

For dry land drilling in relatively shallow rock, a fleet of 20 Joy

Sheet-pile cofferdams, built along the natural bank of the Columbia, protect the dam's powerhouse area. Infiltrating river water is trapped by a concrete collection flume at the base of the cells.

New DODGE "Job-Rated" TRUCKS



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wagon drills with Timken tungsten-carbide rock bits was used on the hard basalt. Twin 3,000-cfm Sullivan compressors in a stationary-type plant furnished the air. For the heavier work outside the cofferdam area, three Ingersoll-Rand Quarrymasters and a Joy Heavyweight Champion rotary rig were employed. Three Quarrymasters—two on one barge and the third on another—did the underwater drilling. All the Quarrymasters used Ingersoll-Rand 6⅜-inch tungsten-carbide bits; the Joy Champion used the Hughes three-legged oil-well-type rotary bit. Blasting was done with Atlas, DuPont, and Hercules explosives.

There is a spot on the Columbia River where one arm of the non-overflow earth-fill section of the dam will have to fill a river closure section which was 275 feet deep at the start. That particular fill will accommodate 3,500,000 cubic yards of material. Working off a 340-foot barge, Euclids from Healy's fleet dumped 1,000,000 cubic yards of the job material at this point. Plenty of swirling water still exists in the big eddy, but the first increment of the final closure is already in. The remainder of the material in Healy's contract was used largely for building other protective cofferdams.

The pile cells, each 67 feet in diameter, presented a considerable pile-driving assignment, for some of the piles were as long as 56 feet, and there was a great deal of welding where splices were needed. The normal length of the piles was 52 feet. Because the operation was over water, it called for sizable pile-driving equipment.

Two derrick barges were brought in under an arrangement with the General Construction Co., Seattle. The rigs were equipped with Gardner-Denver 500-cfm portable compressors which supplied air to the McKiernan-Terry 9-B-3 pile hammers. Two sets of templates were fabricated for use on the rigs. Steel piles were brought in by barge, picked up and strung, and driven to a point close to grade. The final foot or so was driven with a special mandrel which enabled the hammer to drive single piles. Some of the piles were driven to a point where 180 blows caused a penetration of only ¼ inch.

Grading

The primary purpose of the Healy work was to get the excavation down to about 5 feet over the final grade lines and to erect the steel cells and fill them with sand and gravel. This objective had been largely accomplished by the end of last summer when The Dalles Powerhouse Constructors moved in to start the final excavation phase of the job and to begin the powerhouse substructure.

At present, The Dalles Powerhouse Constructors are into much finer excavation tolerances as crews cut through the basalt foundation to establish the intricate slopes and recesses of the powerhouse foundation. This work, which began June 21, 1953, is not scheduled for completion before December 1, 1955. Gardner-Denver and Joy wagon drills and jackhammers, powered by a Worthington compressor, are doing the work, along with ten Euclids, a P&H 1055, and a Northwest 80-D.

Subcontract arrangements have been made with the Curtis Gravel Co., Spokane, Wash., for all the rock aggregates. A Noble automatic batch plant is being installed, along with three 4-yard concrete mixers. One of the concrete-placing features will be the use of Koehring Dumptors for the transportation of mixed concrete.

Right from the start, all high-tension powerlines throughout the powerhouse area were strung on fir poles which stand 80 feet high. Construction cranes and other equipment can thus work in perfect safety under all normal conditions.

Corps of Engineers operations at The Dalles Dam are under the general supervision of Col. T. H. Lipscomb, district engineer at Portland. He is being assisted by B. L. Peterson, chief of the engineering division; T. W. Ragsdale, chief of the operations division; J. L. Kemple, chief of the construction division; and H. B. Elder, resident engineer.

The Dalles Powerhouse Constructors consists of the Donovan Construction Co., St. Paul, Minn., sponsor; the Winston Bros. Co., Minneapolis, Minn.; the C. F. Lytle Co., Sioux City, Iowa; McLaughlin, Inc., Great Falls, Mont.; the S. Birch & Sons Construction Co., Great Falls; the F & S Contracting Co., Butte, Mont.; Foley Bros., Inc., St. Paul; Johnson, Drake & Piper, Inc., Minneapolis; and Fegles Construction Co., Ltd., Minneapolis.

The Dalles Powerhouse Constructors' field forces are under the direction of Al Bacon, project manager; A. L. Ellis, general superintendent; C. W. Bingham, assistant superintendent; Charles Palmetier, chief engineer; and Howard Latham, safety engineer. THE END

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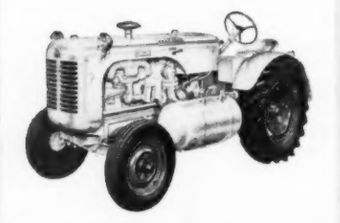


Le Roi Tractair — Combination 35-hp tractor and 105 cfm compressor

Le Roi-CLEVELAND Wagon-Drills — duty model DR30 and lightweight

Experimental Scraper Has Four-Wheel Drive

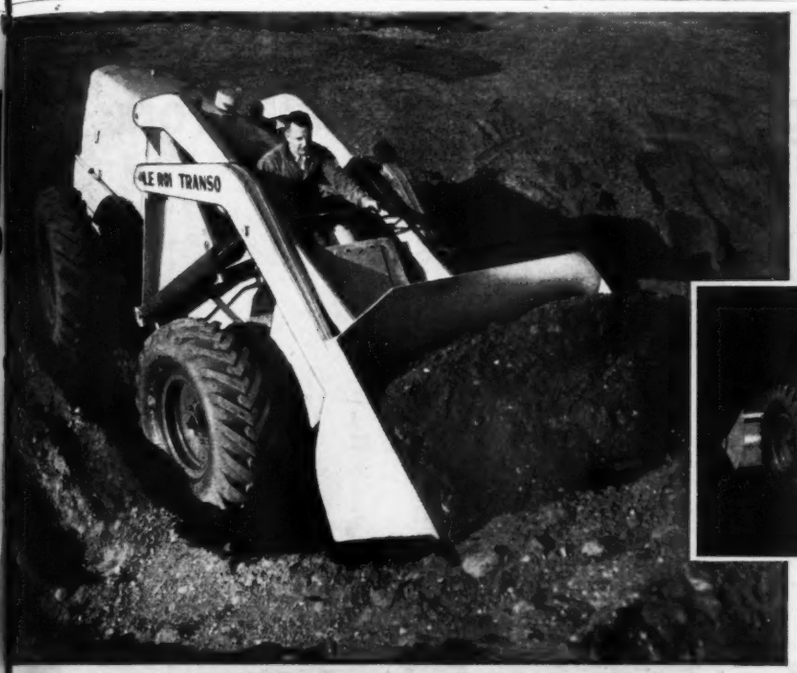
As a further development of the principles successfully used in the four-wheel-drive Euclid Twin-Power scraper, the Euclid Division of the General Motors Corp. has recently placed two new experimental four-wheel-drive scrapers on construction projects in North Carolina.

The scrapers are rated at 18 cubic yards struck measure. All four wheels are driven by a 300-hp diesel engine mounted behind the scraper bowl. The engine power is transmitted to the rear axle and forward to the front axle through a driveshaft and universal joints mounted along one side of the scraper bowl. The unit is unique in that it has no tractor, adding to its maneuverability and allowing it to make short turns.

This Euclid scraper is one of two experimental four-wheel-drive models undergoing tests.

The scraper has been tested with a hydraulically controlled bulldozer blade which is removed when the unit is applied to high-speed haulage.

The manufacturer reports that the four-wheel-drive principle provides excellent traction. Field tests to date, on the Ohio Turnpike and on coal stockpiles, indicate that the scraper has the ability to self-load many materials. These experimental units are now being assigned to construction operations to accumulate field experience under actual job conditions. No production of this model is scheduled for 1954, pending the outcome of these field tests.



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Front-end Loader
4-wheel drive.
Short (84") wheel base.
1½-yd. struck flush bucket capacity.
Maximum dumping height of 14' allows easy clearance of bins, hoppers, etc.
Low 36" to 48" normal carry position reduces lift time from ground.

LE ROI-TRANSO TL-100
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1-cu. yd. capacity. 2-wheel drive.

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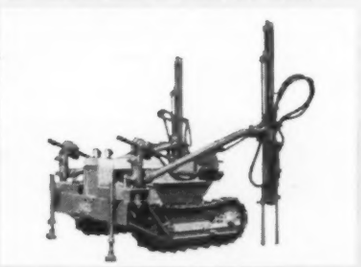
Le Roi-CLEVELAND Paving Breakers and Sinkers — Sizes from 18 to 80 lbs.



Le Roi-CLEVELAND T-286 Self-Propelled Dual Drill Rig — equipped with air-feed sinker drills or drifters

Line of Tractor Shovels For Crawler Tractors

■ A line of tractor shovels for mounting on International crawler tractors is illustrated in literature from the Drott Mfg. Co., 3481 W. Wisconsin Ave., Milwaukee 8, Wis. The four Drott skid-shovel models described, the 6K3, 9K3, 14K3, and 18K3, are designed for the International T and TD 6, T and TD-9, TD14-A, and TD-18A, respectively. Bucket capacities range from ⅞ to 3 cubic yards.

One feature illustrated is a pry-over-shoe break-out action that produces a digging or pry-out force ranging from 9,000 pounds on the Model 6K3 to 27,200 pounds on the 18K3. This is accomplished by a lever that transmits the force into the ground rather than putting it on the tractor. Power for the pry-out force is obtained through a reverse cylinder action in which the hydraulic pressure pushes on the face of the piston with the greater area.

A further advantage is the unit's bucket roll-back which brings the bucket from 26 to 38 inches closer to the tractor. The bucket load is transported at ground level on loader shoes. In addition to the buckets, the line of attachments shown includes bulldozer blades, grubber blades, rock forks, and other accessories.

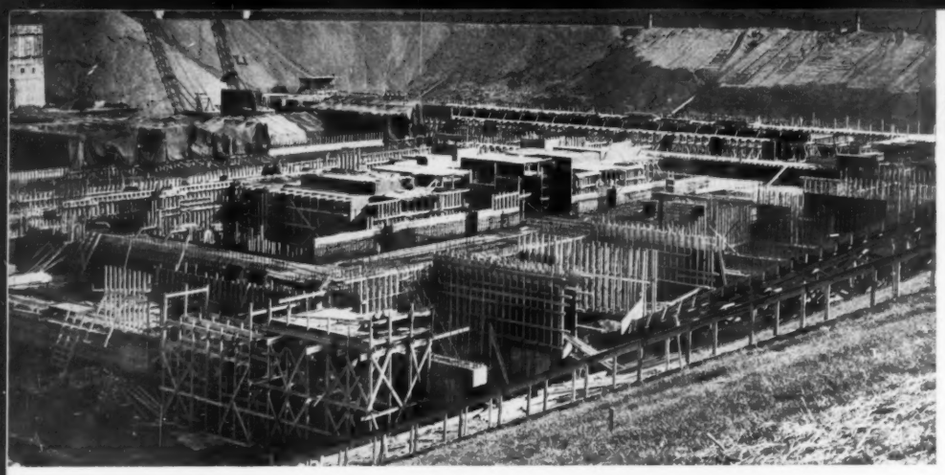
To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 98.

Belt-Conveyor Pulleys

■ Belt-conveyor pulleys are described in literature from the Atlas Conveyor Co., Clintonville, Wis. The Atlas solid steel pulleys have rims that are welded to steel disks to make a rigid true-running pulley. They are available in face widths of 14 to 44 inches.

Rubber lagging can be furnished on either crown or straight-face pulleys as required. The lagging consists of 3-ply 28-ounce duck with ⅛-inch rubber cover and is applied spirally under tension to secure a tight fit. The pulleys can be furnished with shafts, bearings, and belt idlers.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 102.



A general view of the powerhouse construction. The job site is protected from the river by the long dike in the background. At the left, a pair of P&H cranes are at work.

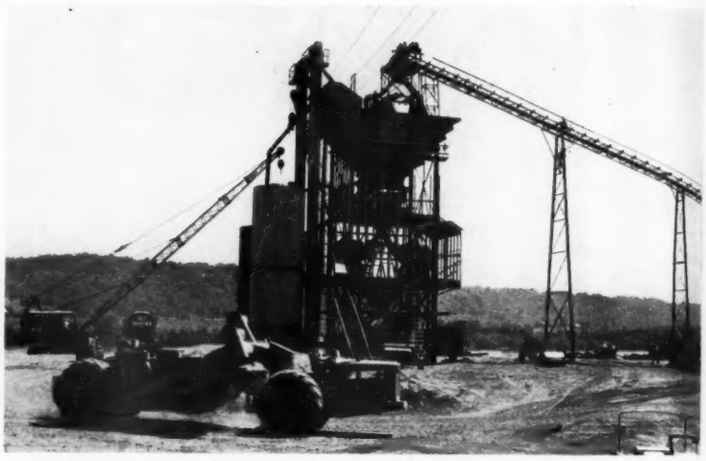
Photo by W. M. Krider

New Generating Plant To Power AEC Works

ELECTRIC POWER—1,200,000 kw of it—will be supplied to the Atomic Energy Commission works near Portsmouth, Ohio, by the Clifty Creek plant of the Indiana-Kentucky Electric Corp., now being built on the Ohio River in southeastern Indiana, near Madison. Ground for the steam-generating plant was broken December 5, 1952. The first of the six generators is slated to begin producing electricity in January, 1955. Full capacity operation is scheduled to get under way in June, 1956.

Clifty Creek tumbles over a steep bluff of the Ohio River in what has been set aside as Clifty Falls State Park. The new plant is going up on a flat plain just above the flood stage of the Ohio. General contractor for the project is the Sollitt Construction Co., Inc., South Bend, Ind.

The Green Construction Co., Oaktown, Ind., was the contractor for the clearing and grading. The plant site occupies about 700 acres and is situated between the river and the base of the adjacent bluffs. It is typical



A Tournapull speeds past the Erie concrete plant. Aggregate from the stockpiles moves up the General conveyor at the right. Two Smith 2-yard mixers, on a platform below the storage bins, turn out the concrete. *C&E Staff Photo*

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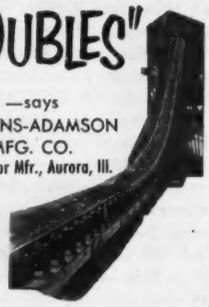
—says STEPHENS-ADAMSON MFG. CO.
Conveyor Mfr., Aurora, Ill.



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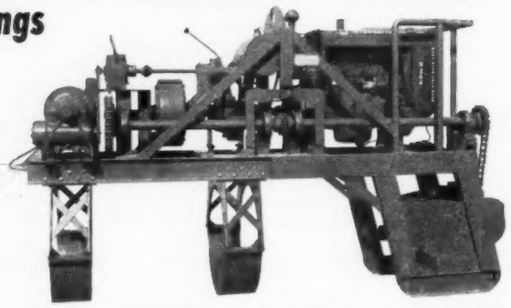

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Wellpoints dewater site along Ohio River for 350 x 800-foot concrete powerhouse; Sollitt Construction Co. has contract

The four Moretrench wellpoint pumps in the foreground keep the excavation dry as preparations are made to pour the deepest footings. On the levee in the background is the concrete-mixing plant. *C&E Staff Photo*

river-bottom land and contained a heavy growth of underbrush plus many very large old trees. Some of the cottonwoods and sycamores measured more than 6 feet in diameter.

Clearing

Green cleared and grubbed 200 acres of this land with dozers powered by three Caterpillar tractors, a D7, and two D8's. All the small trees and brush and most of the large trees were grubbed without sawing. Where it was not necessary to grub the stumps, Mall chain saws with 7-foot blades sawed the large trees. Some of these trunks were so heavy that extra tractors with cables were called on to aid the D8's in their removal. Clearing operations required approximately six months of the winter and spring of 1953.

Early in the 1953 construction season, Green moved in with earthmoving equipment consisting of 5 Tournapull C Roadsters, 5 Caterpillar DW21 scrapers, 6 Allis-Chalmers HD-20 tractors, 8 Cat D8's with LeTourneau FP scrapers, 4 Cat tractors with dozers, 2 Caterpillar No. 12 motor graders, 2 Northwest Model 95 draglines, a Northwest Model 25 dragline, and some other pieces.

Tractor scrapers were used on hauls up to 800 feet in length. The rubber-tired Tournapulls and DW-21's worked the longer hauls, which sometimes were as much as one-half mile in length. In general, the draglines were used where they could dig and cast.

Powerhouse Footings

The largest excavation was for the powerhouse building which will measure 350 x 800 feet. The excavation for this structure descends 72 feet below the top of the river dike and is 27 feet below normal river level. Tractors and scrapers removed the material, hauling it to the river dikes and nearby fills.

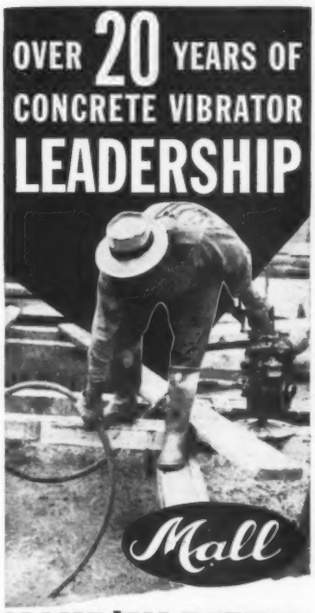
Below river level, the excavation was kept dry by a Moretrench wellpoint system, installed and operated by the American Dewatering Co., Chicago, Ill., making it possible for the scrapers to excavate down to footing grades.

Two large storage areas, one for coal cinders and the other for fly ash, were graded on the east and west sides of the plant. The entire site is protected from flood waters by a long dike which rises 45 feet above the natural river bank; the plant itself is protected to 58 feet. Some of the dike was built by the 2½-yard draglines which excavated behind and cast the material into the dike.

Compaction of the dikes and other fill areas was accomplished with four sheepsfoot rollers pulled by Caterpillars. A Huber three-wheel roller compacted the surfaces of the roadways, parking areas, and other areas topped with crushed rock. Special compaction was required for an area within the deep building excavation for the three tall stacks that will rise 680 feet into the air. Here, carefully selected granular material was watered to optimum moisture content and thoroughly rolled with

(Continued on next page)

OVER 20 YEARS OF CONCRETE VIBRATOR LEADERSHIP



MAKE 'EM BETTER KEEP 'EM BETTER

That has been the MALL Objective for over 20 Years of Concrete Vibrator Manufacture

MALL pioneered in the development of concrete vibration—and over the years MALL Vibrators have earned the reputation of *being good* and *staying good*. Reason: MALL developed the best method of vibration, built the best type of machine to use it, and kept job-testing and making improvements until today MALL Vibrators have a quality, stamina and performance that gets jobs done faster, easier and better than ever before. Job-test one.

A VIBRATOR FOR EVERY JOB

Take your pick—gasoline engine, electric or pneumatic—a wide choice of models in many sizes to meet every job requirement. Get more facts—mail the coupon.

40 Factory-Owned Service Warehouses, Coast to Coast for Fast, Dependable Service.

MALL TOOL COMPANY 7743 S. Chicago Ave. Chicago 19, Illinois

Send me more facts about Mall Concrete Vibrators.

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CU-100

BLACKHAWK DUAL-ACTION DOZER

BLACKHAWK Half-Tracks provide extra traction, flotation, stability; combine with Dual-Action Dozer for low cost, highly efficient dirt and snow moving equipment.

BETTER IN SO MANY WAYS

- Accurately controlled hydraulic down pressure and lift. Cuts into hard soils, frozen ground.
- Blade may be angled in 5 positions. Use as bulldozer or angledozer.
- Conveniently located frame tilting device tilts blade to left or right.
- Blade lifts to height of 18". Sufficient clearance for passing through ditches, over curbs, or down steep banks.
- Accessories include adjustable side plates and skid shoes to make soil peeling easy and prevent gouging. Blade extension, spring kit and skid shoes convert 6' blade to snow plow.

BETTER FOR SO MANY JOBS

Backfilling — Removing Top Soil — Leveling — Landscaping — Terracing — Grading Cleaning Ditches—Excavating—Snow Clearance—Light Road Maintenance

ARPS CORPORATION

DEPT. C NEW HOLSTEIN, WIS.

PRODUCTS FOR BETTER FARMS, BETTER INDUSTRIES SINCE 1920

(Continued from preceding page)

a Bros 50-ton four-wheel pneumatic roller pulled by an International TD-18.

Production

At times of top production, the earth-moving fleet was handling 20,000 cubic yards of material per 12-hour day. Work continued through the end of the 1953 season on a six-day basis. By the end of December, 3,400,000 cubic yards of material had been moved, virtually completing the earthwork phase.

All repairs on the earth-moving equipment are handled in the field by a crew of five mechanics and a welder. Equipped with a 300-amp Hobart welding generator and several small portable generators for night lighting, the repair crew worked day and night to keep the equipment operating.

Lubrication was handled by seven workmen using two Ford trucks equipped with greasing facilities. Grease and oil were dispensed directly from bulk containers through air-operated equipment. Greasing was done during the noon shutdown and after working hours in the evening.

Concrete Production

On the dike near the powerhouse, Sollitt, the general contractor, set up a large electric concrete plant to mix the 200,000 cubic yards of concrete required on the project. Dump trucks haul the concrete from the plant to the pouring sites where it is placed with cranes and buckets, or wheeled to the forms in buggies.

Aggregates are received by barge at a dock on the river. A Northwest crane with clamshell bucket unloads the barges into a surge bin from which trucks haul on a steep road up the levee to the stockpiles. Stockpiles are built over tunnels containing conveyors which transport the aggregates to the plant.

Under each stockpile there are two Erie tunnel gates which can be remotely operated by means of electric and air controls. When these gates are open, the material flows down onto an 18-inch General Conveyor belt in the tunnel. The 275 feet of conveyor in the tunnels discharges onto a 24-inch inclined conveyor 295 feet long, leading to the top of the plant.

A remote-control three-way distributor at the end of the inclined conveyor distributes the material to any of the three bins at the operator's option. Each section of the three-compartment Erie bin holds 60 to 65 cubic yards.

Bulk cement is received in bottom-dump hopper cars on a siding right at the concrete plant. An undertrack screw and bucket elevator carries the cement to the 235-barrel storage bin. Overflow is stored in a 900-barrel Erie cement silo.

Fly Ash

Fly ash is used in relatively large quantities in the concrete mix and is stored and handled in equipment similar to that used for cement. The fly ash is received in self-unloading trailer-trucks which discharge into a hopper. Screw and bucket conveyors carry the material to a 65-barrel storage tank in the plant tower with the surplus overflowing to a 500-barrel storage silo.

Below the aggregate and cement storage bins, an Erie three-beam scale weighs out the batches into a batch hopper from which the mixers are charged. Two T. L. Smith front-end-charge mixers with a capacity of two cubic yards each are mounted below the batch hopper for convenient gravity loading.

The two tilting mixers discharge the concrete into a 12-cubic-yard collecting hopper. Remote-control air-operated gates in the bottom of the hopper open to feed the mix into dump trucks which haul to the job.

For stockpiling aggregates, bucketing concrete to the forms, and erecting forms, Sollitt has two new P&H Model 655 cranes as well as three older P&H Model 255's, a new P&H truck crane, and a Northwest Model 25.

Subcontracts and Personnel

The three reinforced-concrete stacks are being built under subcontract with the Custodis Construction Co., Inc., New York City. In other contracts, 18,000 tons of structural steel is being furnished and erected by the Mississippi Valley Structural Steel Co., Melrose Park, Ill.; boilers are by the Babcock-Wilcox Co., Barberton, Ohio; and

Hardfacing

Check the COMPLETE VICTOR LINE

VICTOR hardfacing alloys save you time and money with faster application, smoother deposits, longer wear!

See your VICTOR dealer now . . . get the facts, and you'll get VICTOR!

VICTOR for welding

Profitable dealerships open; inquire now!

For Manual Application

THIS HARD-FACING ROD	FOR THESE CONDITIONS	FOR THIS EQUIPMENT	APPLI-CATION
VICTORTUBE	Severe abrasion	Scarifier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth	Acety. AC-DC Elec.
VICTORTUBE "SPECIAL"	Abrasion, severe impact	Oilfield bits, rock bits	Acety. only
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutters, brick augers, pug mill knives, screw conveyors, farm tools	Acety. AC-DC Elec.
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides	Acety. AC-DC Elec.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	Acety. AC-DC Elec.
VICTORITE 1	Corrosion, heat, abrasion	Saw teeth, carbon scrapers, wire guides, rocker arms, steel mill applications	Acety. AC-DC Elec.
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies, cams, hot punches, pump shafts	Acety. AC-DC Elec.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	Acety. AC-DC Elec.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	Carb. arc Acety.
VICTORALLOY	Abrasion, severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers, roll crushers	Acety. AC-DC Elec.
VICTORALLOY #1	High abrasion, medium impact	Bucket lips, rock crushers, Muller tires, gyratories	Acety. AC-DC Elec.
VICTORALLOY "A"	Angular shock, extreme impact, build-up	Clutch parts, gears, crusher plates, gyratory mantles, build-up for hardfacing	AC-DC Elec. only
VICTORALLOY "B"	Heavy impact, moderate abrasion	Tractor rollers and sprockets, shovel pads, plates, idlers, etc.	AC-DC Elec. only
VICTORALLOY "C"	High abrasion, moderate shock and impact	Tractor grousers, pressure rolls, crusher segments, roll crusher teeth	AC-DC Elec. only

Also VICTOR Bulk Metals, VICTORITE Plow Point Bars, and VICTOR Super-Titan Blasting Nozzles

For Automatic Application

THIS TYPE	FOR THESE CONDITIONS	ON THIS KIND OF EQUIPMENT
VA #1	Abrasion, medium impact	Crusher rolls, crushers, gyratory crushers
VA #2	Abrasion, impact, Multi-pass application	Steel mill applications
VA #3	Abrasion, light impact	Mill guides, crushers, dredge bushings
VA #4	Multiple layer build-up	Tractor rails, crane wheels, general build-up
VA #5	Heavy impact, abrasion	Tractor rollers, idlers, mine car wheels, sheave wheels
VA #6	Medium abrasion, high impact	Crane wheels, drums, roll necks
VA #7	Abrasion, high impact	Build-up for hardfacing
VA #8	Abrasion, medium impact	Dozer bits, roll crushers, scraper blades
VT #60	Extreme abrasion	Tool joints, grader blades, scraper blades, augers

VICTOR EQUIPMENT COMPANY
ALLOY ROD AND METAL DIVISION
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H-11

Special compaction is given the area on which three tall stacks will be placed by a Bros 50-ton four-wheel pneumatic-tire roller pulled by an International TD-18 tractor.

C&E Staff Photo

turbo-generators are by the General Electric Co., Schenectady, N. Y. Approximately 1,000,000 gpm of cooling water for six condensers will be taken directly from the Ohio River through a series of tunnels.

E. T. Snodgrass is the supervising engineer for the Indiana-Kentucky Electric Co. Paul L. Powell is project manager for the Sollitt Construction Co. THE END

Lighter Truck Models With Aluminum Parts

■ Two special lightweight truck models for heavy hauling have been designed by the Autocar Division of the White Motor Co., Ardmore, Pa. The largest single weight-saver in the new models is the all-aluminum driver cab. Other aluminum parts include the motor hood, most crossmembers of the chassis, the transmission case and cover, the auxiliary transmission case and cover, the rear axle housing and hubs, and the front bumper. The wheels are of forged aluminum.

One of the new models is powered by a V-8 engine and the other, with a diesel. Both are six-wheelers.

Typical examples of the weight-saving include a difference of almost 300 pounds between the aluminum and steel cabs, a difference of 34 pounds between the aluminum and steel motor hoods, and a difference in the gas tank of 91 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 57.

Data on Cableways

■ A brochure illustrating tautline cableways is available from Sauerman Bros., Inc., Department C-34, 522 S. Clinton St., Chicago 7, Ill. Photographs, sketches, and text describe types, spans, working loads, and other details. The new catalog illustrates cableway applications that will be of interest to construction and consulting engineers, public utilities, and industrial concerns.

The Tautline cableway performs all the functions of an overhead crane. It lifts, transports, and deposits its loads anywhere within the span of the machine. The brochure lists the following practical advantages: a cableway operates over any kind of terrain, water, or chasm; it does not interfere with work beneath the span or pose any traffic problem; it operates at comparatively high speeds; it is economical to operate and maintain; and it lifts and deposits loads gently and requires minimum ground space.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 77.

Lightweight DC Plant For Portable Power

■ A new electric plant for use where a portable source of direct current is needed is announced by the Universal Motor Co., 511 Universal Drive, Oshkosh, Wis. The Model 2050-M is light in weight for its 2-kw 115-volt output and has carrying handles for portability. Its total weight is 165 pounds. This plant is recommended for such uses as powering floodlights or operating ac-dc tools on construction projects.

The unit is powered by a one-cylinder air-cooled gasoline engine of 4 hp that operates at 2,800 rpm.

The Universal Model 2050-M electric plant for portable-power use.

A four-quart gasoline tank is built into the plant. The heavy-duty close-coupled generator has a control panel which contains four twist-lock receptacles for plug-in operation of tools, appliances, and floodlighting equipment. A pilot light is also provided.

For further information write to the company for Bulletin DPE, or use the Request Card at page 18. Circle No. 36.

March is Red Cross Month. Membership means your participation in relief to disaster victims, in nursing services, and in safety programs.

"We have replaced 2 or more crawlers with 1 Tournatractor on every job,"

reports President William E. Ward of Construction Service, Inc. in Ohio

"We have spent only *$56.80* on our machine No. 1 since its purchase in August, 1951. We've had no repairs on Unit No. 2 after three months' use," continues Owner Ward.

Tournatractor's 4 rubber-tired wheels replace 500 wearing parts of a crawler track assembly . . . save hours of regular maintenance. The big low-pressure tires absorb shocks and jolts . . . permit high-speed travel anywhere without planking.

FLIES JOB-TO-JOB — With offices in Minford, Ohio; Ludlow, Ky; and Charleston, West Va, Contractor Ward makes the rounds in his own plane. This way, he keeps his many jobs rolling at top efficiency.

Pulls loaded 45-ton trailer

With its low downtime and faster speeds, Tournatractor No. 2 keeps all tractor work ahead of schedule on construction of plant facilities for a chemical firm in southern Ohio. Pulling a 45-ton trailer, the 186 hp tractor moves equipment and steel. It also handles scattered dozing jobs, prepares access roads for trucks, assists motor cranes, trucks, and crawlers that get stuck in the very wet sand.

Works where crawlers cannot

Tournatractor No. 1 has been a fixture at an Atomic Energy project near Cincinnati since its purchase in 1951. In early stages, 36 crawlers were also on the job. Now that the site is criss-crossed with pavement, only the Tournatractor has been retained to finish the project. It levels dump areas, moves shanties, grades parking areas, stockpiles coal, and backfills. It is still running on its original 1951 tires.

Get all the facts

Compare your crawler expenses for 24 months with the Construction Service record of $56.80 upkeep for Tournatractor. Then think about "go-anywhere" speed of 19 mph, plus 8 mph reverse, and what that means in production. Then arrange with your LeTourneau-Westinghouse Distributor for a demonstration on your job. Get the facts, then judge for yourself.

Tournatractor—Trademark T-464-B-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

HERE'S A FASTER, EASIER, CHEAPER WAY
TO HANDLE MORE DIRT, ROCK OR GRAVEL!
OMAHA STANDARD TRAILERS

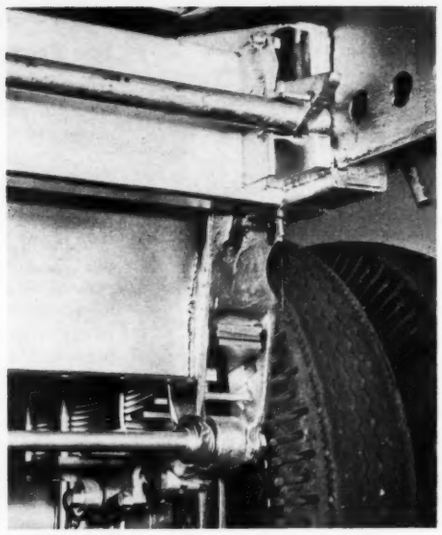
The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge and axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
★ Dumping mechanism FOOL-proof—trouble-FREE!
★ Release on doors INSTANT, SHOCK-PROOF, protected from material flow.
★ DOOR OPENING Meter control that can be *pre-set*.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today Dept. A.

OMAHA STANDARD FACTORY & GENERAL OFFICES
2411 West Broadway Council Bluffs, Iowa



The solid steel bar at upper left is inserted into holes in stationary steel beams to hold the new Trailmobile shiftable tandem suspension in place at any position.

Shiftable Suspension Helps Meet Axle Laws

■ A new shiftable tandem-axle suspension for Trailmobile truck-trailers makes it unnecessary to reload or shift the load in order to conform with varying maximum state legal axle weights. The wheelbase can be lengthened or shortened as desired. The manufacturer reports that the mechanism for moving the tandem suspension forward or backward is easily manipulated so that the changes can be made quickly.

The shiftable tandem works with any type of tractor including cab-over-engine, conventional, tandem, or pusher type. The device is used when cab-over-engine tractors are interchanged with the conventional-type tractor or in states where the axle laws vary or tandem tractors are used. The shiftable tandem adds approximately 700 pounds to the trailer. With its use, the average load can be increased, and it is possible to adjust the load on axles as the load decreases en route without shifting the load.

The total distance that the tandem suspension can be moved is 45 inches, but the weight distribution can be adjusted to a fine degree since the shifts can be made in increments of three inches in either direction. Three different basic settings are available.

The tandem is locked in the desired position by two removable solid-steel bars which are placed through holes spaced every three inches in the two stationary beams. One crossbar locks the forward end of the suspension, and the other locks the rear.

Bronze blocks fastened to the lower subframe of the tandem suspension slide on a stainless-steel track along the base of the two stationary steel beams. Bronze and stainless steel are used to prevent corrosion and to eliminate the need for painting, both of which would increase friction and hinder the sliding of the suspension.

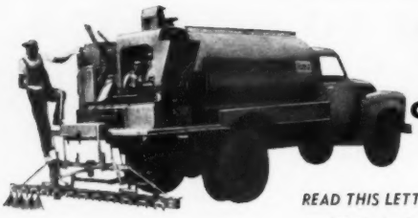
For further information write to Trailmobile, Inc., 31st and Robertson Aves., Oakley, Cincinnati 9, Ohio, or use the Request Card at page 18. Circle No. 2.

To say that we are well pleased with our

ROSCO DISTRIBUTOR

would be stating it mildly!

Ed M. Knott, Asst. City Eng. Muscatine, Iowa



"One of the Best Pieces of City-Owned Equipment"

READ THIS LETTER from Ed M. Knott of Muscatine:

"Early in the summer of 1951 the City Council of Muscatine purchased a Rosco 1000 gallon capacity Distributor and mounted it on a 1½ ton truck. To say that we are well pleased with our Rosco Distributor would be stating it mildly.

"We started our extensive road program last year and our Rosco was in constant use every day it was possible to work. We seal-coated 150 blocks of City Streets and in addition to this, constructed 36 blocks of road mix asphalt, besides oiling nearly 100 blocks of City Streets.

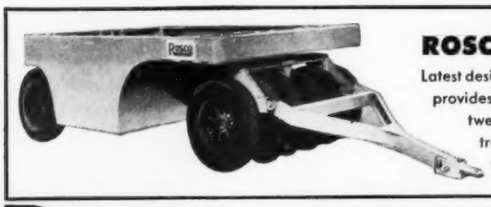
"During all this time we had only one minor breakdown on our Rosco which was taken care of in less than 2 hours time by our own mechanics.

"All of this work was done directly under my supervision and I feel well qualified to praise our Rosco as one of the best pieces of equipment owned by the City of Muscatine and we own nearly $150,000 worth of street construction equipment of all makes.

"This year we are planning another heavy schedule of street improvements and when we start in a few weeks I entertain no fears as to what our Rosco will and can do for us."

- Uniform application through exclusive Pressure Metering
- Use any length of Spraybar without changing pressure
- Accurate, non-clogging, no-streak Vee-Jet Nozzles

Ask your dealer, or write Rosco for the full story of the Bituminous Distributor with "P.M."—the Pressure Metering Method.



ROSCO-PACTOR

Latest design compaction roller provides positive lap between front and rear tread. 9 and 13 wheel models.

ROSCO MINNEAPOLIS
3118 SNELLING AVENUE • MINNEAPOLIS 6, MINNESOTA
DISTRIBUTORS • MAINTAINERS • BROOMS
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Don't Let Water Stop You!

The Manu-Mine organization can help you solve your difficult ground water problems through its contracting and consulting service. Specialists in:

1. Stopping the flow of water through walls, foundations, geological strata, etc., by chemical soil solidification
2. Stabilization of soils around foundations and footings
3. Water reservoir rehabilitation and construction
4. Ground water studies
5. Geological and mining studies
6. Air-placement of concrete
7. Highway engineering

Let us know your problem and we'll be glad to discuss it with you. Call or write:

Manu-Mine Research & Development Co.
P. O. Box 167, Reading, Pa. Telephone: 4-2778

Finance Firms Increase Role in Contracting

Industrial finance companies are playing an increasing role in financing purchase of construction equipment, Arthur O. Dietz, president of C. I. T. Financial Corp., recently pointed out. He said this development is increasingly important in view of the $5,500,000,000 annual expenditures now being scheduled for highway construction.

The head of C. I. T. attributed his firm's growth in this phase of the business to the experience which the sales-finance company has gained in installment financing of automobile dealers, and in applying this to problems of dealers in building-equipment lines. Many contractors and dealers prefer finance companies for equipment loans, leaving open their local bank credit for use for short-term needs. Terms on equipment loans run from 18 months to three years, which is generally longer than the terms offered by banks. Approximately 75 per cent of C. I. T.'s current construction equipment business is done through dealers.

Pioneer Bituminous Guide

A pocket-size bituminous handbook, of interest and aid to asphalt contractors, superintendents, and foremen, has been published by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., a subsidiary of Poor & Co., Chicago, Ill.

The guide deals with central mix plants and bitumens in general and with Pioneer Continuflo bituminous plants in particular. With the aid of charts, tables, and pictures, it gives a detailed description of the construction, operation, and maintenance of the three popular models of bituminous plants made by Pioneer.

Copies of the 164-page book may be obtained without cost by writing the company.

Lightweight aluminum stages made by the Louisville Ladder Co., 1101 W. Oak St., Louisville 10, Ky., are used for spanning open spaces between steel girders on large buildings. A 24-foot-long stage, 20 inches wide, capable of spanning a 22-foot-on-center girder construction to give a sturdy work platform, weighs only 90 pounds. Several stages can be used side by side for covering wide areas, and they can be fitted with hooks for special job conditions. For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 60.

HUNT PROCESS

CONCRETE CURING COMPOUNDS

NOW AVAILABLE IN SOUTHEAST

Write for complete information

HUNT PROCESS CORP., SOUTHERN
RIDGELAND, MISSISSIPPI

Western Factory & Main Office
HUNT PROCESS COMPANY, INC.
7012 Stanford Ave., Los Angeles 1, Calif.

TRIPLE ECONOMY

It's the biggest truck news of '54

Gross capacities up to 40,000 lbs. GVW with new Tandem-Axle BIG JOBS! Two all-new models, 4 wheelbases each. Priced with the lowest.

1. NEW LOW-FRICTION ENGINES offer power increases up to 23% with *gas-saving economy!* One reason: modern short-stroke design cuts down on internal friction waste as much as 33%!

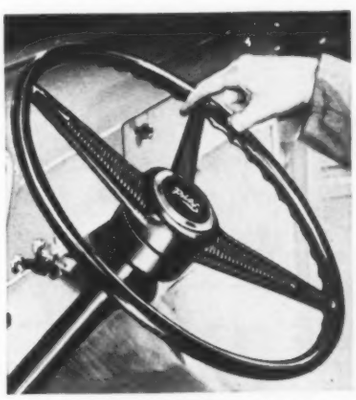
2. NEW 3-MAN DRIVERIZED CABS cut fatigue. New long-wearing woven plastic seat upholstery. Exclusive Ford seat shock snubbers! Huge one-piece windshield!

3. NEW CAPACITIES! New Factory-Built 6-Wheelers, up to 40,000 lbs. GVW! Two new Cab Forward BIG JOBS! Ford's 221 models offer low curb weights, top payloads!

Ford advances *further* with big new savings in all 3 vital truck areas! There's *more* gas-saving power! *Still better* drivers' working facilities! *Big* capacities, too!

New Ford Trucks for '54 offer the mightiest concentration of power per cubic inch ever built into *any* truck engine line! And, smaller-displacement engines like Ford's five new truck powerplants normally need *less* gas! That's only *one* big factor behind Ford Truck *Triple Economy* for 1954. For more information, write: Ford Division, Ford Motor Co., Dept. T-10, Box 658, Dearborn, Michigan—or call on your Ford Dealer, *today!*

5 great truck engines: 115-h.p. *Cost Clipper* Six, 130- and 138-h.p. *Power King* V-8, 152- and 170-h.p. *Cargo King* V-8!



NEW Ford Master-Guide Power Steering is standard on new Series T-800 and (with 152-h.p. V-8) T-700 BIG JOBS; optional at worthwhile extra cost on most other BIG JOBS. Cuts steering effort as much as 75%!

ONLY FORD gives you Gas-Saving, LOW-FRICTION, High-Compression, Overhead-Valve, Deep-Block engines in *all* truck models! Advancements like rotating valves increase valve life and full-flow oil filter lengthens engine life.

FORD *TRIPLE ECONOMY* TRUCKS

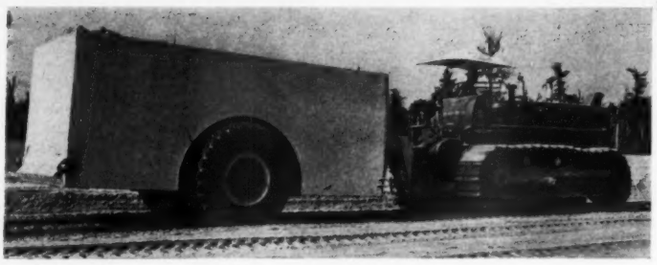
MORE TRUCK FOR YOUR MONEY

Pneumatic Rollers

■ The Grace Model W18R 50-ton pneumatic roller is now offered with a bolt-on tongue, making it adaptable for use with either crawler tractors or large rubber-tired tractors.

This model has four 18:00 x 25 24-ply tires on oscillating axles. Weight of the unit is 9 tons empty. Loading to 50 tons with sand or gravel is accomplished without heaping, according to the manufacturer.

The Grace line also includes pneumatic rollers that use 7:5$ x 15 tires and give increased rolling width with enough overlap of the tire tracks to leave a smooth surface. It offers rollers in 11 and 15-wheel models and also 9 or 13-wheel units on special order.



The Grace Model W18R, a 50-ton pneumatic roller, being pulled by an International Crawler tractor.

Rolling width of the 11-wheel unit is 79 inches and of the 15-wheel model, 9 feet, with tires overlapping nearly 1 inch. A sturdy tongue that can be connected by one man is a feature of these rollers. They have large bearings and heavy wheels and axles and are ordinarily loaded from 7 to 10 tons gross weight.

For further information write to the W. E. Grace Mfg. Co., 6000 S. Lamar St., Dallas 15, Texas, or use the Request Card at page 18. Circle No. 114.

DISTRIBUTORS

ALABAMA—Tractor & Equipment Co., Inc., 4402 First Ave. N., Birmingham 1; 800 Church St., Decatur; Ray-Brooks Machinery Co., 2279 W. Fairview Ave., Montgomery; P. O. Box 357, Mobile.

ALASKA—Western Tractor & Equipment Co., Box 2032, Anchorage; Box 407, Fairbanks.

ARIZONA—State Tractor & Equipment Co., 407 S. 17th Ave., Phoenix. Lively Equipment Co., Albuquerque, N. M.

ARKANSAS—Euclid-Arkansas, Inc., 702 W. Second St., North Little Rock.

CALIFORNIA—Geo. H. Philpott Co., Inc., 1060 Bryant St., San Francisco; 239 W. Maple St., Monrovia; Sierra Machinery Co., Inc., P.O. Box 1330, Reno.

CANADA—Dietrich Collins Equipment Ltd., 890 S. W. Marine Dr., Vancouver 14, B. C. Ferguson Supply Alberta Ltd., Calgary, Edmonton and Lethbridge, Alberta. G. H. Godsall Equipment Ltd., 26 Jackes Ave., Toronto; P. O. Box 187, Port Arthur, Ontario; P. O. Box 69 NDG., Montreal, Que. Maritime Newfoundland Agencies Ltd., P. O. Box 822, Halifax, N. S.

COLORADO—Colorado Builders' Supply Co., 1300 West Evans Ave., Denver.

CONNECTICUT—The W. I. Clark Co., 2193 Dixwell Ave., New Haven.

DELAWARE—L. B. Smith, Inc., Camp Hill, Penna.

FLORIDA—Florida-Georgia Tractor Co., 2906 W. Beaver St., Jacksonville; 2415 State Rd., Lakeland; 3130 No. Miami Ave., Miami; 1400 S. Orange Blossom Trail, Orlando; New Quincy Highway, Tallahassee; 216 S. 12th St., Tampa.

GEORGIA—Tri-State, Inc., 880 Glenwood Ave. S.E., Atlanta 1; East Side Highway, Macon; Olive Rd., Augusta; 712-16 No. Washington St., Albany.

HAWAII—Grace Brothers, Ltd., 770 Ala Moana Road, Honolulu 10, Hawaii.

IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 No. 4th St., Pocatello.

ILLINOIS—Gil Speer Equipment Co., 7625 South Kedzie Ave., Chicago 29. Euclid Sales & Service, Inc., St. Louis 10, Mo.

INDIANA—Reid-Holcomb Co., 1815 Kentucky Ave., Indianapolis 21. Gil Speer Equipment Co., Chicago 29.

IOWA—Herman H. Brown Co., Des Moines, Cedar Rapids and Sioux City. Fehrs Tractor & Equipment Co., Omaha 2, Neb.

KANSAS—The G. W. Van Keppel Co., Kansas City 3.

KENTUCKY—Euclid-Kentucky, Inc., 3900 Crittenden Drive, Louisville.

LOUISIANA—Euclid-Memphis Sales, Inc., Memphis 2.

MAINE—H. A. Burditt, Inc., Route 1, R.F.D. 2, South Portland.

MARYLAND—Rish Equipment Co., Clarksburg, W. Va. L. B. Smith, Inc., Camp Hill, Penna.

MASSACHUSETTS—Clark-Wilcox Co., 118 Western Ave., Boston 34. The W. I. Clark Co., New Haven, Connecticut.

MICHIGAN—W. H. Anderson Co., Inc., 47 West Seven Mile Rd., Detroit 3. The Euclid Road Machinery Co., Hibbing, Minn.

MINNESOTA—The Euclid Road Machinery Co., Highway 169 West, Hibbing.

MISSISSIPPI—Euclid-Memphis Sales, Inc., Memphis 2.

MISSOURI—Euclid Sales & Service, Inc., 5231 Manchester Ave., St. Louis 10. The G. W. Van Keppel Co., 3401 Pennway, Kansas City 8.

MONTANA—Hall-Perry Machinery Co., P. O. Box 1367, Butte.

NEBRASKA—Fehrs Tractor & Equipment Co., 1809-11 Cuming St., Omaha 2. Colorado Builders' Supply Co., Denver.

NEVADA—Sierra Machinery Co., Inc., P. O. Box 1330, Reno; Geo. H. Philpott Co., San Francisco; Monrovia, California. Pacific Equipment Co., Salt Lake City 8, Utah.

NEW HAMPSHIRE—Clark-Wilcox Co., Boston 34, Mass.

NEW JERSEY—L. B. Smith, Inc., Camp Hill, Penna. Hubbard & Floyd, Inc., New York 51, N. Y.

NEW MEXICO—Lively Equipment Co., 2601 No. Fourth St., Albuquerque.

NEW YORK—Hubbard & Floyd, Inc., 151st St. & Gerard Ave., New York 51. T. E. Potts Equipment Co., 2280 Sheridan Dr., Buffalo. L. B. Smith, Inc., 357 W. Fayette St., Syracuse 3; 134 State St., Albany.

NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 880, Greenville; P. O. Box 1205, Charlotte; Swepson Creek Rd., Asheville; P. O. Box 136, Guilford; P. O. Box 665, Wilmington. Hampton Roads Tractor & Equipment Co., Norfolk, Virginia.

NORTH DAKOTA—Northwestern Equip. Co., Box 152, Fargo. Northwestern Equip. Co. of Minot, Box 335, Minot.

OHIO—The W. W. Williams Co., 835 Goodale Blvd., Columbus 8; 18301 Brookpark Rd., Cleveland 11; 914 Main St., Cincinnati 15; 1360 Cemant St., Toledo (Maumee).

OKLAHOMA—Butler-Sparks Equipment Company, Oklahoma City and Tulsa.

OREGON—Intermountain Equipment Co., Boise, Idaho. P. L. Crosbie & Co., 2145 N.W. Pettygrove St., Portland.

PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12. Standard Equipment Co., 152 Horton St., Wilkes-Barre; Northern & Lycoming Sts., Williamsport. L. B. Smith, Inc., Camp Hill (Harrisburg); 29th & Montgomery Avenues, Philadelphia.

RHODE ISLAND—Clark-Wilcox Co., 2323 Pawtucket St., E. Providence.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 185 E. Butler Ave., Memphis 2. Power Equipment Co., 1318 Island Home Ave., Knoxville; 600 W. Manning St., Chattanooga; 121 Clay St., Kingsport.

TEXAS—The Euclid Road Machinery Co., 1007 Levee St., Dallas 2. Lively Equipment Co., P. O. Box 1436, El Paso.

UTAH—Feutzer Equipment Co., 1261 So. 2nd West, Salt Lake City 8.

VERMONT—Clark-Wilcox Co., Boston 34, Mass.

VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 36th and William Ave., Norfolk. Rish Equipment Co., 1601 Chamberlayne Ave., Richmond 30; 403 Center Ave. N.W., Roanoke 7.

WASHINGTON—Western Tractor & Equipment Co., 2230 First Ave., S., Seattle 4; 605 Prindle St., Chehalis; Rt. 12, Box 94, Tacoma. Intermountain Equipment Co., E. 611 Sprague Ave., Spokane 2. P. L. Crosbie & Co., Portland, Oregon.

WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh. Rish Equipment Co., Kanawha Blvd., Charleston 22; Rte. 50 & U.S. 50, Clarksburg; P.O. Box 389, Bluefield. L. B. Smith, Inc., Philadelphia, Penna.

"Euc" Twin-Power Scraper . . . the One-Man Earth Moving Spread!

High production with one man and one machine

- Total of 380 or 400 h.p.
- 16 cu. yds. struck
- Two Torque Converters
- Two Torqmatic Transmissions
- 4-section reversible and interchangeable cutting blades
- Hydraulically actuated bowl, apron & ejector—only 13 ft. of cable

Five years of field experience have proved the versatility of the Twin-Power Scraper for contractors, large and small . . . it's a self-loading scraper in practically any material.

It's paying off for . . .

LARGE CONTRACTORS . . . as an independent production unit or self-contained utility scraper for all loading, hauling and grade conditions.

MEDIUM SIZE CONTRACTORS . . . requiring maximum production with minimum capital investment . . . and scrapers that can work when adverse weather and job conditions stop other equipment.

SMALLER CONTRACTORS . . . who can bid on subcontracts with limited equipment and personnel . . . its versatility has helped to make these users successful bidders on big jobs, too.

But seeing is believing, so ask your distributor where the nearest "Twins" are working or see the new Euclid color film featuring the Twin-Power Scraper at work on a wide range of jobs. A new folder, Form T551, is available for the asking.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment GM GENERAL

Portable Belt Conveyor

■ A 36-inch-wide portable belt conveyor is offered in various lengths by the Kolman Mfg. Co., W. 12th St., Sioux Falls, S. Dak. The company reports that this is becoming one of the most widely used sizes among its Model 101 heavy-duty conveyors. This unit carries an 8-foot x 48-inch vibrating screen which is entirely supported by the conveyor during operation and need not be removed for transportation.

The Model 101 conveyor is now available in 18 to 36-inch belt widths. Single and double-deck vibrating screens of many different sizes are available for mounting on these or on any other make of conveyor, taking power from the conveyor. A feature of these units pointed out by the manufacturer is that the vibrating screen can be swung from the operating position to an upside-down position under the end of the conveyor without any disassembly of the drive. This folding back of the screen shifts its weight forward so that conveyors can be towed with even the larger vibrating screens attached, thus adding to the speed and safety of changing locations.

A Kolman Model 101 36-inch conveyor with a Model SB-80 vibrating screen scalps out oversize and loads gravel into an Omaha Standard 10-yard center-dump trailer.

Other features include self-cleaning tail pulley, bar-type self-lagged head pulley, all antifriction bearings, choice of greaseless or regular ball-bearing idlers, and pneumatic tires. There is a separate clutch for individual operation of the vibrating screen and conveyor belt, a hydraulic hoist with V-type carriage trucks for low road clearance, and a self-cleaning steel belt cover. The steel bulldozer trap, available as optional equipment, is an integral part of the conveyor tail section and is therefore also fully portable. Dual tires are included on 50-foot x 30-inch and larger sizes.

The design of the frame and carriage section permits installation of large 7 and 8-foot vibrating screens, even on the smaller sizes such as the 40-foot x 24-inch units, without requiring awkward supports during operation. A large gravel trap or hopper can be added to the tail section for either dozer or shovel loading. Thus, neither screen nor trap is a limiting factor in the capacity of the Model 101.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 29.

Data on Pipeline Filter

■ A small pipeline filter for compressed air or gas under pressures up to 40 psi is illustrated in literature from the Dollinger Corp., 11 Centre Park, Rochester 3, N. Y. A variety of Staynew low-pressure models features reduced weight and simplified construction.

The filter performs two separate cleaning actions. Mechanical separation is accomplished by a deflector cup that directs the flow of air or gas together with oil, rust, scale, and dirt to the walls of the housing and then downward at high velocity into the base where liquid and heavier particles are deposited. Filtration is done also as mechanically cleaned air or gas rises at low velocity through the filtering element which removes the last traces of foreign material.

Two types are available. The CH Model has a radial fin insert that gives a larger active filtering area and lower flow resistance. The standard medium will remove particles down to 3 or 4 microns in size. The AA Models have absorption pads and are recommended wherever moisture control is a problem. A cutaway drawing is used in the literature to illustrate the interior of the filters.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 96.

Top Performance on the Toughest Jobs... anywhere!

At Folsom Dam in California, Savin Construction Co. used Twin-Power Scrapers as part of their large Euclid fleet. This well known contractor has purchased seven "Twins", having added additional units as a result of outstanding performance of his original machines on the New Jersey Turnpike. On big jobs like these, the flexibility of this scraper really pays off in high production and low cost per yard.

"Twins" have proved to be an ace in the hole for J. C. Critcher Inc. of North Carolina in getting larger, more profitable contracts. On this mountain highway job the "Euc" gave such a good performance that a second machine was purchased before completion of the contract. With two 190 h.p. engines and torque converters, the "Twin" easily climbed grades where crawlers and pans had to have pusher assistance.

Working in sandy clay on this Alabama road job, the Twin-Power Scraper proved a versatile, high production machine for L. J. Cousins Construction Co. Ability to self load and carry heaped loads up to 24 cu. yds. at speeds five or six times as fast as crawler drawn scrapers makes this "Euc" a top performer on small jobs as well as the big ones.

Tough loading conditions on the New York Thruway are taken in stride by the five Twin-Power Scrapers used by John Arborio on a 2½ million yard contract. Because of their tremendous power and traction the "Eucs" were able to work in the sticky, wet clay that stymied other equipment on this section of the big job.

Working on the Ohio Turnpike for Western Contracting Corp., this Euclid Twin-Power Scraper has top extensions that increase the struck capacity to 21 cu. yds. On one section of the job, the scraper picked up loads averaging 23 cu. yds. in 1 minute and made a complete 4700′ cycle—load, haul, spread and return—in 5.3 minutes.

Stripping blue clay at an open pit gypsum quarry in Iowa, this Euclid has plenty of power and traction to self load and haul to the waste dump at high speed. Daily production records on this job show that a Euclid Twin-Power Scraper can move as much yardage as four crawler tractors and pans of comparable size on an 800′ haul.

WRITE TODAY for performance data and a new catalog on Euclid Twin-Power Scrapers

EUCLID DIVISION GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Automatic Welding Is Faster, Cheaper

By IVAN R. BARTTER, General Manager,
Automatic Welding Co., Elm Grove, Wis.

Welds are superior and wear resistance is greater; three machines can handle 90 per cent of the work

FOR SEVERAL YEARS, production plants have been substituting automatic or semi-automatic arc welding for much manual arc welding because of decidedly faster and better work results. It was logical, then, to apply the same type of equipment for buildup and hard-surfacing of worn components, provided that setups capable of doing such jobs on diversified parts could be devised.

Such a conclusion prompted the establishment of the Automatic Welding Co., Elm Grove, Wis. Events have fully justified it, for the machines are kept busy virtually to capacity. They are adaptable to widely diversified parts and do the work efficiently on a level comparable to that attained in production plants.

The work is done faster, and the welds are far superior. Higher speed saves labor, and the precision obtained by the welding machines is such that little or no grinding of built-up parts is needed. Wear resistance usually exceeds that for new components, insuring longer service. Costs average about 60 per cent less. It has not been difficult to find plenty of customers, for there is a large demand for renewing worn components.

Construction-Equipment Parts

Tractors, shovels, dozers, and the like can be made serviceable again after heavy use if worn parts are built up by arc welding.

Most of the jobs require buildup either on surfaces of rotation, as on track or other rollers, idlers, and sheaves; or on flat surfaces, such as tracks and plates. Three relatively "universal" machines do about 90 per cent of the work for the Automatic Welding Co.

One of the machines is made up of an automatic Lincolnweld head supported, along with a large flux hopper and a reel holder, on a carriage that can be traversed horizontally at any set speed along a track beam whose height is adjustable. Below the beam is a conventional positioner having a single spindle on which the worn component is mounted. For building up cylindrical surfaces, the spindle is set in the horizontal position. Flanges can be built up at right angles or at other angles. If the work is conical, as, for example, in the case of crusher

REDUCE YARD-MILE COSTS BY USING HOBBS *Schonrock Cable Dump* TRAILERS

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- INCREASES YOUR PROFITS
- PULLS ITSELF OUT OF MUD
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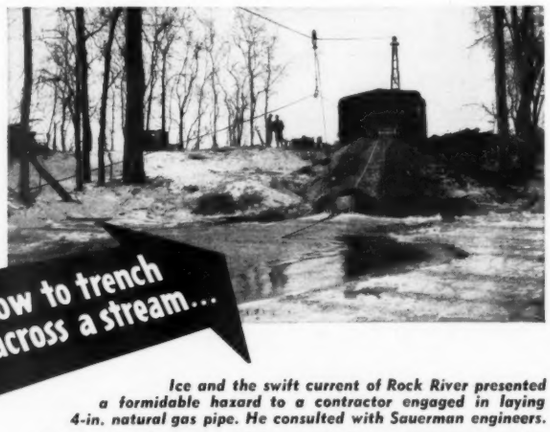

How to trench across a stream...

Ice and the swift current of Rock River presented a formidable hazard to a contractor engaged in laying 4-in. natural gas pipe. He consulted with Sauerman engineers.

The result was an efficient working arrangement using equipment best suited for that particular job. The crossing was made with minimum expense and risk.

A track cable was stretched across the river and hung so it closely paralleled the slope of the river bed. A Sauerman Crescent Scraper was attached to a single-wheel carrier which rode the track cable. Digging depth was almost automatic, since the scraper could dig no further than the length of the cable which attached it to the carrier. The track cable also served to keep the scraper working in a straight line.

The ¾-cu. yd. Crescent was powered by a two-drum hoist. Maximum span was 700 feet. One man handled the entire trenching operation. A second man was used occasionally to check the depth of the cut. Material pulled in by the scraper was removed by a small clamshell.

For complete information on this and similar projects send for Field Report 219 and Catalog J.

*More "Hows" to tough problems**:

How To Clean A Muddy River—Field Report 209
How To Clean Under A Bridge—Field Report 209
How to Dig Under A Building—Sauerman News 137

*Available on request

To find out "how" your particular problem can be handled consult Sauerman's engineering department.

SAUERMAN BROS., Inc.
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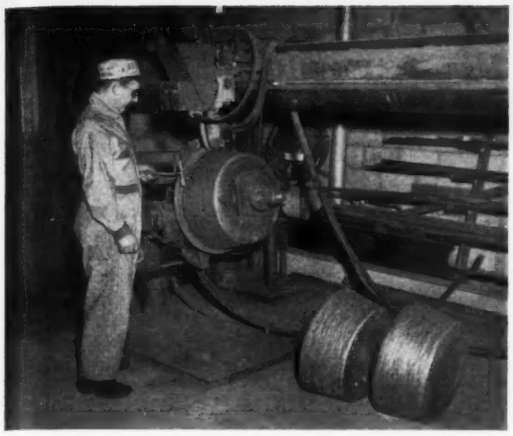
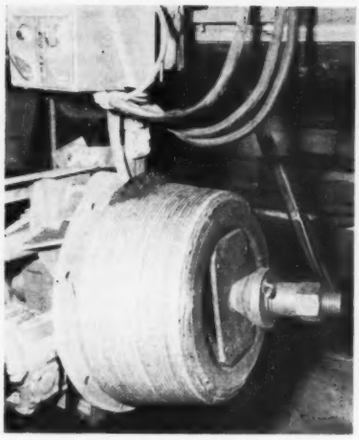
CONTRACTORS AND ENGINEERS



Conical surfaces of crusher rolls are built up on this machine, which was designed and built by and for the Automatic Welding Co. Included in the rig is a Lincoln automatic head and a positioner with angular adjustment.



Here is a closeup of the machine for conical surfaces. The welding is so precise and so uniform that generally no grinding of the finished surface is required.

And here is the machine used to build up tractor rails and for other long straight-line jobs. The bed that supports the trough can be tilted for side welds and inverted so that the flux can be dumped.

rolls, the spindle is tilted until the topmost cone element is parallel to the track.

In this machine, the spindle speed is generally set to give a surface speed, equal to welding speed, of about 25 inches per minute. Carriage traverse is set so that the bead is continuous and close to and fused with the one laid down in the previous turn. Automatic control of the head keeps the bead at uniform height.

Machine for Track Rollers

A second rotary machine, similar to the first one, has a positioner fitted with an indexing disk on which four gear-driven spindles are mounted. This machine is used to resurface large numbers of track rollers. One roller is attached to each of the spindles, but only one at a time is in weld position. When one layer has been applied to the cylindrical surface of the first roller, the indexing disk turns the next spindle to the weld position. When a layer has been applied to this roller, the third is positioned, and so on. Each roller is thus able to cool between layers. Usually, three or more layers are required to restore original size. Cooling between layers results in smoother welds and in less shrinkage of the bore than if there were no cooling periods.

When the cylindrical surfaces are built up, the positioner is rocked so that spindles and rollers are at a suitable angle for building up the roller flanges. This work is also done one layer at a time with cooling between passes. Then the rollers are reversed end for end so that the remaining flanges can be built up.

This completes the welding on the set of rollers, but it also results in some shrinkage of the bore, usually by 0.01 to 0.04 inch. This is desirable because bores are often worn oversize and rolls would have to be scrapped unless the bore contracted. When the welding is completed, each roller is resized in a boring mill. It is not necessary to grind or otherwise refinish the OD.

Straight-Line Machine

Automatic straight-line welding, especially to build up flat surfaces, is done in the third machine. It can make welds 28 feet long. It is equipped with a 30-foot bed of re-

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Contract-winning bids are bids based on facts. Put a versatile, fast-working Mobile Drill B-27 to work making economical exploratory tests. When you know earth formations you can figure your bid to the penny. You'll be winning contracts over the stiffest competition and insuring your profits. 43 State Highway Departments use Mobile Drills in their preliminary investigations—real proof of Mobile's stellar performance.

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WORLD'S LARGEST MANUFACTURER OF LIGHT VEHICLE POWERED DRILLS

inforced ¾-inch steel plate to which web and flange stiffeners and side walls are added. The walls form a trough that is filled with flux to submerge the arc as welds are made. Hinge or trunnion pins fasten the bed to supports and permit it to be tilted and inverted.

Above the bed and adjustable for height by motor-driven screws is a beam supporting a carriage arranged to move lengthwise. This carriage supports the automatic Lincolnweld head which can be moved transversely as well as being traversed longitudinally. Work to be welded in this machine is clamped to the bed with the weld line paralleled to the carriage ways. Then flux is poured into the trough until it covers the work. This makes it unnecessary to feed flux in large volume from a moving hopper. This setup is employed chiefly to build up worn surfaces of crawler tractor track rails consisting of links pinned together.

Before automatic welding starts, manual arc welding is used to fill in the narrow grooves at the link intersections. This makes it possible for the automatic head to lay down continuous beads. Otherwise, these beads would have to be intermittent and, at each new starting point, would lack the uniformity desired.

Tilt Bed for Sides

After buildup on the upper surfaces, the bed is tilted to permit similar buildup on side surfaces. When all buildup has been completed, the bed is inverted to dump the flux. The track rail is then removed to a cutting bench where an oxyacetylene flame cuts away the metal welded temporarily into the grooves at the link intersections. This makes the track rail ready for use.

Buildup in this machine is rapid as weld beads are laid down at the rate of 20 to 30 inches a minute. The electrode wire is Lincoln No. L 201 of 5/32 or 3/16-inch diameter, used with L 760 agglomerated flux. The cost for track renewed in this manner is about half as much as new track and includes the price of new or reground link pins and new bushings.

This machine can be used for any linear welding but is best adapted to handling long jobs. It has been used effectively for welding new gripper lugs onto track plates, a job that long has been done much more slowly by hand in many shops. New lugs of high carbon steel are purchased and are welded to the "roots" of old lugs that have first been flame cut to afford flat surfaces. When the new lugs have been tack welded in place at the ends, the plates are placed in a row in the bed of the machine so that all the joints to be welded are in line.

Then, the automatic head makes all welds on one side in a single pass along that side. A similar pass follows on the reverse side, completing the joints. In this welding, the arc is broken and restruck when passing the spaces left between plates. Eighty per cent penetration is attained, and the joints are stronger and beads much more uniform than if they were hand welded.

Can Weld Wide Bead

Rather unusual but exceedingly useful is another job done on the long machine. Using a Lincolnweld head equipped with an oscillator, a 2-inch-wide bead can be laid down on large Trackson bucket lips. Such a highly wear-resistant deposit is very useful in this and in some other cases. It is made, in this instance, by using Lincoln H-550 hardsurfacing flux and mild carbon L 201 wire 5/32 inch in diameter. This agglomerated flux contains alloying elements which are added to the weld metal through the flux rather than through the wire.

Some manual arc welding is still required at the Automatic Welding Co., but it is confined largely to tacking and other short welds, irregular surfaces, or to work in locations in which machine welding is impractical. THE END

YOU CAN HANDLE BOTH TODAY'S AND TOMORROW'S NEEDS WITH THE...

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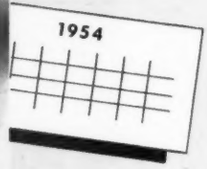

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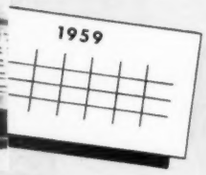

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You can increase production capacity 50% with only minor modification costs—when you own a MADSEN Model 481 4000-lb. Asphalt Plant!

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● If a 4000-lb. asphalt plant will handle your needs today . . . why invest now in a plant of larger capacity? Purchase the MADSEN Model 481 as a 4000-lb. plant, and five years from now, as your needs are increased . . . you can convert this plant into a 5000-lb. or 6000-lb. asphalt plant. Since the MADSEN Model 481 is designed basically as a 6000-lb. batch capacity asphalt plant, it will require only minor modification at very little cost, to increase its production capacity to keep pace with your increased needs.

The MADSEN Model 481 Batch Capacity Asphalt Plant handles, on a production basis, the exacting requirements of today's bituminous mix specifications. It mixes faster, more thoroughly, and has that money-making ability to hold top production hour-after-hour. Yes, any way you figure it . . . from a money-making standpoint today or tomorrow — MADSEN IS YOUR BEST BUY IN ASPHALT PLANTS.

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Book Deals with Statics And Strength of Materials

John Wiley & Sons, Inc., has published a new book for the engineering student, "Statics and Strength of Materials", which presents the principles of static and strength and indicates general methods of applying them to the solution of engineering problems. Although principles are emphasized, the book recognizes the fact that both physical and mathematical thinking are basic to a mastery of the subject.

Roland H. Trathen, professor of mechanics at Rensselaer Polytechnic Institute, has written the book to help the student develop analytical ability, and to correlate previous experiences in mathematics and physics with the discipline in mechanics.

More than 500 problems, designed to check the reader's understanding of basic concepts, are included in the volume. Copies of the book may be obtained from the publisher, 440 Fourth Ave., New York 16, N. Y., at $7.50 each.

I-H Appoints Buzard

Now heading the motor truck sales department for the International Harvester Co., Chicago, Ill., is Ralph M. Buzard, formerly assistant manager of truck sales. He succeeds W. K. Perkins, who has become staff assistant to the vice president.

Mr. Buzard started his Harvester career in 1922 as a salesman. He has served as assistant district manager and district manager, at various times, in the northwest, central, and western regions.

Insley's Type WB shovel shown loading a truck.

Excavator-Crane Unit

■ The Type WB excavator and crane is now in full production at the Insley Mfg. Corp., 801 N. Olney St., Indianapolis, Ind. The WB is adaptable to shovel, hoe, hookwork, dragline, clamshell, logging, pile driving, and magnet operations. It is available with crawler, truck, and self-propelled rubber-tired mounting.

The machine's characteristics, as stated by the manufacturer, include the fact that it is able to feed a three-compartment batch bin, normally requiring the use of two ¾-yard machines. The unit also handles a 17,000-pound hammer and a third drum accommodating 200 feet of ½-inch cable. As a crane, the machine handles at least a 100-foot boom, and as a dragline it handles a 1-yard bucket on a 60-foot boom.

Additional operating and mechanical features are power lowering on the main load line, independent travel, multiple travel speeds, independent third and fourth drums, and a high folding power-operated gantry. Pin or butt-connected crane booms, log loading booms, a wide selection of drum laggings, easily removable crawler frames, and counterweights are among other merits.

All drums and high-speed shafts are mounted on antifriction bearings. Involute splining is used throughout. The independent boom hoist is operated with power up and power down. The new shovel is available with gasoline, diesel, or electric power.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 169.

Data on Lightweight Pipe

■ A new bulletin showing typical applications of its lightweight pipe and fittings is available from the Naylor Pipe Co., 1230 E. 92nd St., Chicago 19, Ill. The pipe is recommended for high and low water pressure, cement pumping, dredging, dewatering, drainage, and sand and gravel conveying.

Included in the bulletin are standard specifications on pipe from 4 to 30 inches in diameter, together with data on fabricated fittings, flanges, and connections to meet all pipeline requirements.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 6.

How Drilled-In Piles Are Anchored in Bedrock

■ The design and application of Drilled-In caissons is covered in literature from the Drilled-In-Caisson Corp., 2 Park Ave., New York 16, N. Y.

The Drilled-In caisson is essentially a composite column, restrained and fixed-ended with its lower end in a rock socket. The load of the superstructure is delivered to the caisson and from there to the rock by direct bearing on the base of the socket and by lateral compression, or bond, to the wall of the socket.

The high load capacity of this type of foundation is based on the fact that the load is transferred to bedrock through the wall of the rock socket as well as through the bottom.

Drilled-In caissons have been used for foundations of heavy building structures such as warehouses, powerhouses, and manufacturing plants. They have been used for bridge foundations. By battering, where required, the horizontal forces on these bridges have also been resisted. In the case of bulkheads, the strongest type of anchor can be constructed through their use.

The Drilled-In Caisson Corp. is a concern organized by Spencer, White, & Prentis, Inc., and the Western Foundation Corp. to acquire the exclusive license to install drilled-in caissons. The corporation also designs, builds, and stocks the special machinery and material necessary for the installation work.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 95.

Designed for International TD-6, TD-9, TD-14A, TD-18A Crawler Tractors.

We're not bragging. But we know that contractors are smart buyers. They examine facts — compare features — choose the best value. That's why our whopping 451% sales increase is convincing proof that Drott Skid-Shovels can give you more for your money — *and do!*

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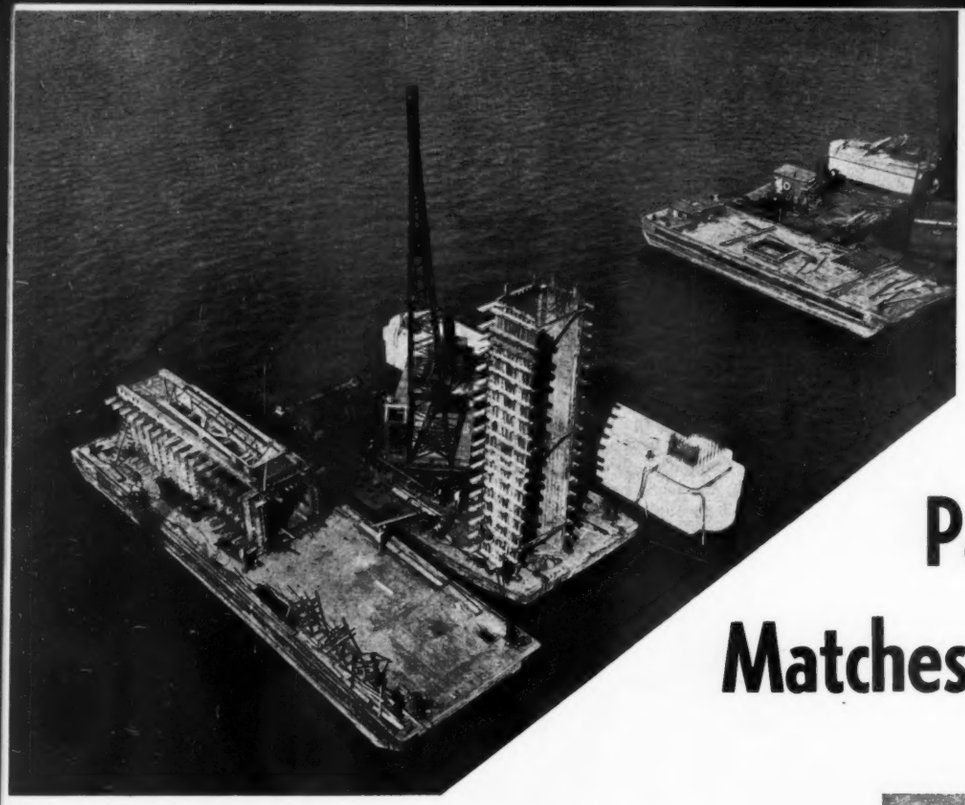


With footings complete, forms are set for pours on the high shafts. Square recesses required at the corners of the shaft made it necessary for the contractor to use a three-sided panel and a one-sided panel. *C&E Staff Photos*

By ALBERT C. SMITH, Field Editor

Parkway Bridge Matches Parallel Span

Steel H-piles, driven to bedrock, support piers for the largest structure on Garden State Parkway

THE RARITAN RIVER BRIDGE, largest of the 371 structures on New Jersey's Garden State Parkway, is now entering final stages of construction.

The job has been a fast one from the start. Frederick Snare Corp., New York, contractor on the eleven river piers, began the first cofferdam in March, 1952, and completed the last concrete shaft before the end of that year. Bethlehem Steel Co., Bethlehem, Pa., which began erecting the 10,000 tons of girders, grids, and bearings soon afterward, is expected to finish work in early summer. The bridge will be opened to traffic this fall. Other sections of the 180-mile parkway, which runs from the New York State line to Cape May, are already in use.

Snare's contract totals $2,446,000, and Bethlehem's is $4,865,000. Poirier & McLane Corp., of New York, has a $1,200,000 contract to construct 17 land piers and 2 abutments. Deck and lighting contracts will be awarded soon.

Parallels Edison Bridge

The new Raritan River crossing will be just west of the Edison Memorial Bridge on U. S. 9, and the architectural features of the piers and the steel plate girders on both bridges are similar.

At present, only two of the three shafts which will support the two 30-foot roadways and a 5-foot safety island are being built at each pier. When traffic requires the bridge to be widened, the third shaft will be constructed on prepared foundations, and another 30-foot roadway will be added. A 2-foot emergency sidewalk will run along the edges of the span.

The 250-foot-long main span provides 135 feet of vertical clearance over the channel. Most of the other river spans are 200 feet long. Pier

A Wiley Whirley removes L. B. Foster pile cutoffs from a cofferdam.

Substructure work nears completion on the bridge. Its architectural features and those of the Edison Memorial Bridge on U. S. 9, right, are similar.

Ready-mix concrete is chuted into Gar-Bro buckets set on a pontoon barge.

foundations consist of tremie seals supported on steel H-piles driven to rock.

Substructure

Frederick Snare Corp. moved in early in March and set up a yard on the north bank of the river. Meanwhile, a dredge operated by the Arundel Corp. was brought in to excavate about 130,000 cubic yards of riverbed material from a 200-foot-wide swath 100 feet upstream from the Edison Bridge. This was necessary to provide a working depth for the huge fleet of floating rigs needed by the contractor to complete the job in the required time.

To provide the maximum amount of working area around each cofferdam, six alternate piers were constructed in the first stage and the remaining five, in the second stage.

In the first stage, eight 14-inch steel pin piles were driven to support each cofferdam. This method was necessary because the soft river material would not support the weight of the sheet piles. When the pin piles were driven and the prefabricated cofferdam frames were set on top, the ZP-32 sheets, supplied by L. B. Foster Co., were placed around the frames and, instead of being driven to a hard material, were simply bolted to the frame. The next step had clamshells excavate as much material as possible from inside the cofferdam.

Pile Driving

Some 45,000 linear feet of 14-inch bearing piles were driven inside the cofferdam with a specially designed rig which was capable of driving piles on batters up to 4 on 1. It consisted of a Wiley Whirley fitted with special 106-foot leads projecting far enough over the sheeting to drive the H-piles. Piles are spaced on 3 and 3½-foot centers in two rings. The inside ring is plumb and the outside ring, battered 5 on 1. The largest piers are supported on about 130 piles.

Excavation

When all the piles were in, the remaining muck was removed with air lifts. And here is where the contractor ran into trouble. Muck on the silty-clay material had stuck to the sides of the cofferdam and could not be moved by the lifts. It became necessary to send divers down to loosen the clay with special underwater jets so that the material could be excavated with the airlifts. The process proved slow and costly.

If the contractor had been permitted to dredge out the riverbed material before any of the cofferdams were started, this problem could have been avoided. But this was not possible because of an unusual subsoil condition. Existing at various depths under a section of the site is a water-bearing sand strata from which several companies and municipalities obtain fresh water. Accordingly, the contractor was required to do all pier excavation inside cofferdams to prevent the infiltration of salt water into the sand strata.

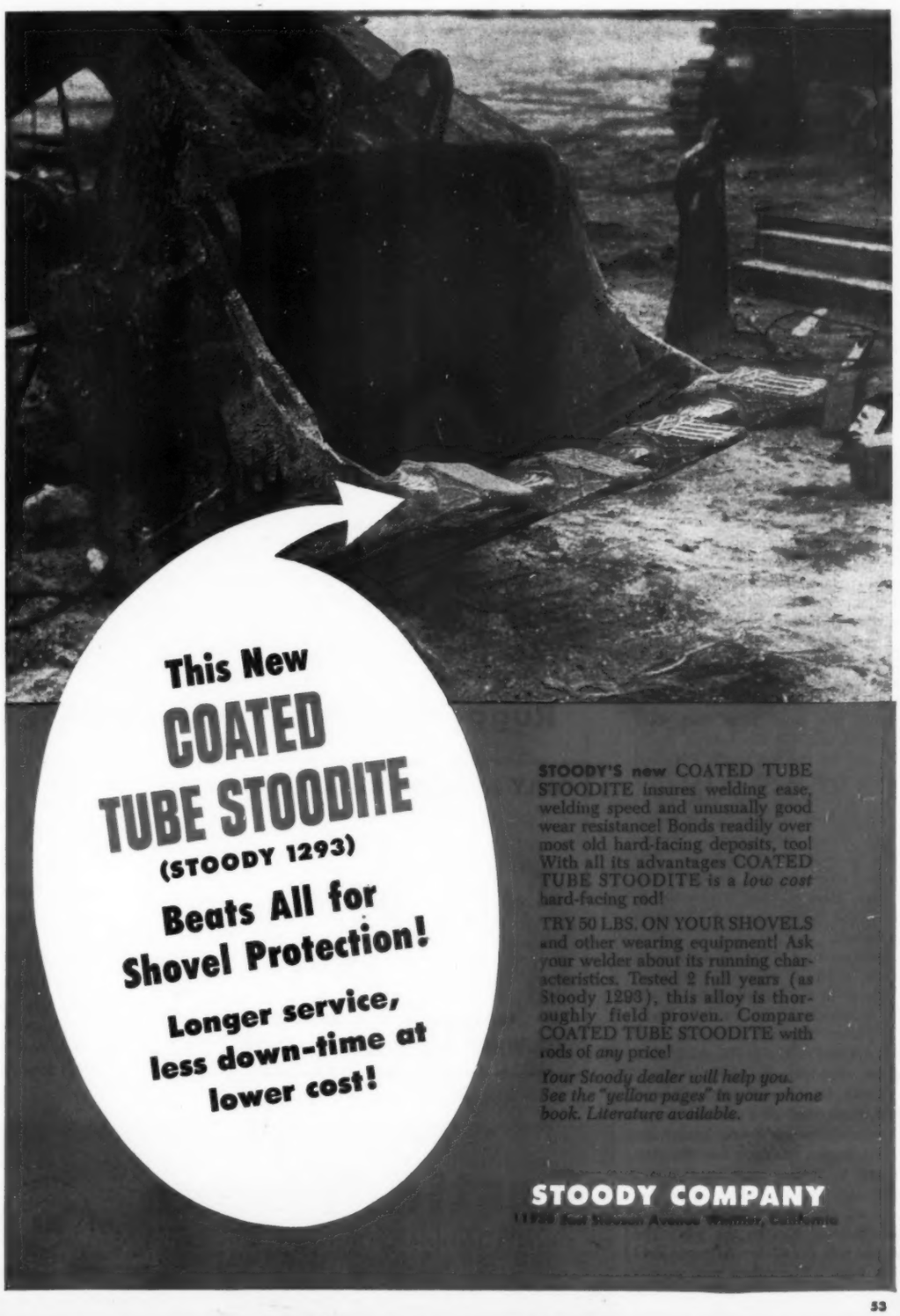
But after the first six piers had been excavated in this way, officials made another analysis of the borings and decided that the second set of five piers was far enough above the sand strata to permit open excavation. This method also made it possible to drive the H-piles before the cofferdam was erected, eliminating the tricky job of projecting the leads of the pile-driver over the sheeting. The change greatly decreased the time required to set and clean each cofferdam.

Tremie

Because of the very soft river bottom, it was sometimes necessary to place a sand blanket inside the cofferdam to prevent the tremie

(Continued on next page)

Gar-Bro buckets are towed out to one of the high shaft pours where a crane on a floating rig will place the ready-mix concrete.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STOODY'S new COATED TUBE STOODITE insures welding ease, welding speed and unusually good wear resistance! Bonds readily over most old hard-facing deposits, too! With all its advantages COATED TUBE STOODITE is a low cost hard-facing rod!
TRY 50 LBS. ON YOUR SHOVELS and other wearing equipment! Ask your welder about its running characteristics. Tested 2 full years (as Stoody 1293), this alloy is thoroughly field proven. Compare COATED TUBE STOODITE with rods of any price!
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STOODY COMPANY

(Continued from preceding page)

concrete from pushing out under the bottom of the sheets.

The tremie pours were the biggest operations on the job. The largest seals were 106 feet long, 26 feet wide, and 18 feet deep. They required about 2,000 yards of concrete, poured continuously at the rate of 70 yards per hour.

All of the concrete, except that for the shafts of the higher piers, was made in a huge floating plant. Aggregates were brought in by scows and loaded into Butler batching bins with a Wiley Whirley mounted on the rear of the plant. Cement was fed from closed scows by Fuller Kinyon pneumatic pumps. Water for the mix was pumped from tanks in the hold of the plant. These tanks were kept full by water boats. Concrete was mixed in two Koehring mixers, dumped into a V-type bucket, raised to the top of a tower, and dumped down the swinging cantilever chute where is was carried to a hanging chute leading to the 12-inch tremie pipe. The pipe was shifted frequently to prevent a high buildup of concrete which might have broken through the soft river bottom.

Top Pours

When the seal was set, the cofferdam was unwatered, the surface of the seal cleaned, and wood forms set up for the distribution block pour. A concrete footing, with a ledge to support the granite facing, was placed on top of the block. The top of the footing extends about 11 feet above water.

As footings were completed, prefabricated forms were brought out for pours on the high shafts. Measuring 9 x 12 feet at the base, all the high shafts have plumb sides with a step-in at the mid-point. They are connected by struts at the top and a strut at the mid-point.

Because of the square recesses required at the four corners of each shaft, it was impossible for the contractor to use a single prefabricated unit for each shaft section. Instead, a three-sided panel and a one-sided panel were prefabricated, allowing the form to be stripped after the single panel was removed.

Only two basic form sizes were required, one for the bottom shafts and one for the top shafts. Plywood panels were backed by 3 x 6 studs and 3 x 10 wales tied with Richmond anchors. On the larger forms, 3 x 12 wales were used. Forms were re-used about six times. The struts were poured around steel trusses, thus making it possible to hang the forms instead of using falsework.

Because most of the concrete pours in the shafts were small compared to those in the foundations, it was not economical to operate the floating plant. Instead, a timber dock was erected on the north shore from which ready-mix trucks chuted concrete into six Gar-Bro 2-yard buckets carried on a pontoon barge. Two such barges were hauled by tugs between the dock and the pier, where a floating rig handled the buckets.

In all, the contractor used about nine floating rigs on the job. The largest was the 65-ton A-frame derrick boat. The other rigs, mostly Wiley Whirleys, were made in several capacities.

Quantities and Personnel

Major quantities are:

Dredging access channel	130,000 cu. yds.
Class "B" concrete	18,755 cu. yds.
Class "C" concrete	16,270 cu. yds.
Steel bearing piles	45,000 ft.
Excavation	10,450 cu. yds.

T. A. Hayes was superintendent for Frederick Snare Corp. J. G. O'Donnell was resident engineer for D. B. Steinman, the consulting engineer.

The work is being done for the New Jersey Highway Authority, headed by R. J. Abbott, chairman, and H. W. Griffin, chief engineer.

THE END

Powered Sod Cutter

■ An improved version of its powered sod cutter has been introduced by the K&N Machine Works, 871 Edgerton St., St. Paul 1, Minn. With the Ryan S-1 or the Coulter X-S-1, one man can cut an acre of sod a day, according to the manufacturer. The Ryan Coulter model has all the features of the standard sod cutter plus the coulter-type disk which cuts runners of creeping-type grasses ahead of the oscillating cutting blade. It cuts sod cleanly without tearing, pulling, or fouling with grass roots.

Operating with a 6-hp Wisconsin AKN or Briggs & Stratton Model 14 engine, the cutters work at the rate of 100 fpm to cut 4,000 to 5,000 square yards of sod per day. The operator has handle-mounted fingertip controls for the engine clutch, cutter bar clutch, and throttle.

The machines have a drive wheel with a knobby tread that gives traction even on slippery turf or extra-hard soil. Heavy dual ball-bearing construction minimizes breakdowns, lessens maintenance costs, and insures longer bearing life, the manufacturer reports. The cutter is available in widths of 12, 15, and 18 inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 70.

WHEN YOU'RE BUILDING ROADS THAT CALL FO

You'll be glad you bough

The operator can do normal ditching and grading, then high lift the blade to any desired bank-cutting position—including the vertical—without leaving the platform.

Heavily made and reinforced to accommodate the extra power of All-Wheel Drive and All-Wheel Steer, the Bulldozer is an essential for many jobs—a time- and money-saver for dozens of others.

Rugged Requirements *demand* Rugged Performance

ONLY AUSTIN-WESTERN GIVES YOU

that unbeatable combination
ALL-WHEEL DRIVE and ALL-WHEEL STEER

There is no doubt about it. Building and maintaining haul roads, access roads, and fire breaks—plus the many general maintenance jobs in the timber country—is rough, tough work, demanding rough tough machines for top performance, and with an Austin-Western Power Grader you get just that . . . get top performance on primary and secondary roads and highways of every type.

Every part is designed and built to the highest possible standards for long service and efficient heavy-duty performance, and Austin-Western Power Graders have been field tested for work capacity the world over on all types of jobs.

From its brawny, tough frame—with plenty of safety margin where extra strength is needed—to its positive, trouble-free hydraulic system—which does all of the work for you—your Austin-Western Power Grader has the proven stamina and ability to get the job done faster, and at lower over-all cost.

Austin-Western
Power Graders · Motor Sweepers
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BALDWIN LIMA HAMILTON BLH
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Geological Service Finds Gravel Deposits

■ Photogeological prospecting, a service that helps a contractor find the most desirably located rock deposits in his building area from the standpoint of hauling costs, is offered by the Washington Commercial Co., 1200 Fifteenth St., N. W., Washington 5, D. C. The company uses trained specialists to explore the land and surface of an area through an analysis of available stereo air photographs and other geological, topographic, water, and soil data. This research, offered on a job basis, can reveal the presence of gravel deposits that nonspecialists doing ordinary ground reconnaissance could easily overlook.

Indications of deposits that are desirable in terms of hauling costs are given the contractor in a geological report. The report shows the localities where deposits of various sorts should be sought in a field examination by the client's own men. With this information, the contractor proceeds with the customary sampling procedures for determining quantity and quality of the materials involved. The stereo air photo prints, marked by the geologist, become the property of the client, who is also given references to the pertinent geological, topographic, soil, and water data used.

Through this service, a county engineer whose area is running short of desirably located gravel and sand deposits is able to prospect for new deposits at a lower cost and in a short time. A road contractor who has been awarded a contract may find new deposits of acceptable materials that will cut hauling costs because of their short haul distance and accessibility. A prospective bidder, using the service to obtain advance knowledge of the most favorably located deposits has an advantage in estimating his costs for jobs.

For further information write to the company, or use the Request Card at page 18. Circle No. 83.

EXTRA POWER AND EXTRA MANEUVERABILITY

han A-W Power Grader

Operator Herb Monroe standing beside an Austin-Western Master "99" Power Grader, one of several owned by the Dwyer Lumber Company of Portland, Oregon.

OPERATOR-APPROVED

"...It takes the combination of All-Wheel Drive and All-Wheel Steer to do the work I must do with a motor grader. With my Austin-Western Power Grader, I can work places and at times of the year when an ordinary motor grader would be practically helpless.

Precision Side-Shift also comes in mighty handy many times every day. Because of full hydraulic controls, all operations are easier and I am not exhausted after a full day's work."

Yours truly,
Herb Monroe
Herb Monroe

OWNER-APPROVED

"....About ten years ago we purchased the first Austin-Western Grader from the Columbia Equipment Company. Since that time we have bought two additional Austin-Western Power Graders. Because we have a great many narrow, crooked steep roads in our operations, we have found these graders excellent machines in construction and maintenance of these roads, and they are also outstanding in snow removal. We think the all-wheel drive and all-wheel steer gives added traction and makes it possible to put and hold the blade where you want to do the most work.

The powered front end and power steer are the outstanding features for our type of work and enables us to use these machines in mud, sand and snow removal.

The maintenance cost on Austin-Western Graders has not been excessive. We believe the new heavier model Master 99, which we recently purchased, will be an exceptionally economical machine to use.

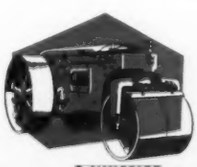
We heartily recommend these machines for any and all grader work."

Yours very truly
DWYER LUMBER COMPANY
BY R. F. Dwyer
R. F. Dwyer, Pres.

POWER GRADERS

HYDRAULIC CRANES

TANDEM ROLLERS


3-WHEELED ROLLERS

MOTOR SWEEPERS

Pressure-Injected Pile Of Rammed Dry Concrete

■ New literature describing a method of making foundation piles by pressure-injecting spread footings into soil is available from the Franki Foundation Co., 114 E. 40th St., New York 16, N. Y. In the Franki Displacement Caisson method, a heavy steel tube, 20½ inches in diameter with 1⅜-inch-thick walls of special alloy steel, is set up in the leads of the driving machine, with a guiding head to hold it in position. Inside the tube is a 13-inch-diameter ram, weighing 7,000 pounds, which may be raised and dropped.

After the casing is located precisely at each site, 3 to 5 cubic feet of dry concrete is dropped into the bottom of the tube and tamped by the ram until arch action causes the dry mix to seize the side of the tube with sufficient friction so that, when the ram is dropped from greater heights and strikes the concrete plug, it will force the plug into the ground, pulling the casing down with it.

When the casing has reached the desired depth, it is raised slightly by heavy tackle, and the plug is knocked loose so that it slips but is not knocked clear of the casing. Then small batches of dry concrete with less than 3½ gallons of water per bag of cement are dropped into the tube through the annular space between the ram and the casing. These charges are heavily rammed until an adequate amount of concrete is forced into the adjacent soil. A spherical bulb is formed of a volume depending upon the density and character of the soil. In loose sand or gravel, this may amount to 25 cubic feet.

After the bulbous footing is formed, repeated small charges are rammed out with 30,000-foot-pound blows against the already-compacted upper earth as the tube is withdrawn, to form a dense and highly compacted shaft of approximately two feet in diameter.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 31.

Metal Sawhorse Legs

■ All-metal folding sawhorse legs are shown in literature from the Wagner Mfg. Co., Cedar Falls, Iowa. The Wagner sawhorse legs are made in four heights. The 24-inch height is standard as used by carpenters. This height can be increased 2 inches if a 2 x 6 cross piece is used instead of a 2 x 4. The 30-inch height, for use with tables and stands, may be increased 2 inches.

The legs are constructed so that they fold compactly and can be transported easily. When assembled, the alligator grip jaws firmly grip the wood cross piece. Provision is also made for even more positive anchorage to the cross piece by means of nails through holes provided in the tabs adjacent to the jaws. Legs are formed from 14-gage steel and thus are heavy enough not only to support considerable weight but also to stand rough handling. The finish is a durable aluminum paint.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 68.

One man operates the discharge spout of the Finn mulch spreader while others unbale the straw and feed it into the intake chute.

A mixture of tar and straw is sprayed over a freshly graded roadside along the Garden State Parkway in Union, N. J., by a Finn mulch spreader during a recent demonstration.

C&E Staff Photos

Officials See New Mulch Spreader

A stretch of newly graded roadside along the Garden State Parkway in Union, N. J., provided the site for a demonstration of a new mulch spreader manufactured by the Finn Equipment Co., Cincinnati, Ohio. Highway officials from New York, Connecticut, and New Jersey watched the trailer-type unit throw a combination of straw and tar up to 50 feet and in almost any direction. The adhesive action of the tar formed a sturdy mulch mat for resisting erosion.

Local officials were particularly interested in the machine's ability to spread straw and low-cost tar at the same time. Normal mulch spreading usually requires that the straw be placed first, followed by the adhesive agent.

Straw is fed into a chute and separated in a V-belt-driven beater. A 24-inch fan blows the straw through the discharge spout as an 8.5-gpm pump adds the tar. Both asphalt and tar may be used as the adhesive for the mulch. The unit's 8-inch-diameter discharge spout has a 210-degree horizontal swing and a 40-degree vertical travel. Maximum range is 50 feet.

Power is supplied by a gasoline-driven Wisconsin engine. The 3,260-pound rig rides on a pair of 6:00 x 16 rubber tires. THE END

Recapping of Large Tires

■ Literature describing tire recapping of construction and off-the-road truck tires is available from Walters Tire Service, Inc., Somerset, Pa. The booklet describes the process step by step.

If an examination proves the tire is acceptable for recapping, the casing is placed in a drying room to remove moisture that may have collected at any cuts or bruises where the cord body has been exposed. After each tire is buffed, cuts or bruises are repaired with new material, and two coats of liquid rubber are applied.

Special machinery built by the company applies the tread to the core body under pressure to prevent the new tread and the cord body from separating later. Heat is applied uniformly for curing.

The literature lists sizes of tires handled and prices for sectional, reinforcement, and spot repairs.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 103.

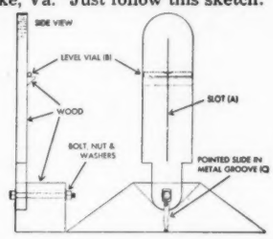
The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

Notekeeper: W. & L.E. Gurley, America's Oldest Engineering Instrument Maker

"Are you on the target?"

"You can easily build yourself an excellent target for both day and night work," writes H. M. Stanley, a Construction Engineer of Roanoke, Va. "Just follow this sketch:



"Use good, dry hardwood. The upright section should have a 1/32" slot *(A in diagram)*, through which light is visible. A bracket on the reverse of the upright—fastened at right angles to longitudinal slot—holds a level vial *(B)*. The slot is vertical when vial is level.

"The upright section is held to a base by a pivot bolt. Also attached at the bolt is a pointed metal slide, moving in a metal groove *(C)*. This slide moves through a line which is a projection of the vertical slot. It can be extended to position the slot accurately over a point on sloping terrain.

"At night I use a three-battery flashlight, held by a wire frame behind the slot. By day, the sun is reflected through the slot by a mirror. Having used mirrors in the national forests, I recommend them for day work. For day or night work, I recommend my Gurley reticle. It makes any problem a pleasure."

Level on stilts

Have you tried this method for leveling over corn fields or groves of fruit trees? Letters from all over are telling us how surveyors are finding this short cut helpful. All you do is remove the sliding legs from your extension tripod and replace them with lengths of one-inch thinwall conduit.

"Let's give credit where credit is due," says James Ritchie, Field Engineer for Charles E. DeLeuw, Consulting Engineer, Amherst, Ohio, who used the tip on the Ohio Turnpike. "We learned about this from 'The Surveyor's Notebook', put out by Gurley, maker of the best level ever built."

Leveling over Ohio corn field.

"The Surveyor's Notebook" collection is crowded with many field hints like these. More than 30,000 surveyors and engineers are finding these reports helpful. Write for your free copy of **Series 2.**

Ask to see the NEW Variable Power Eyepiece

Now standard on all Gurley levels, Variable Power eliminates the need for more than one eyepiece in changes of magnification. With "VP" you go from high to low and back again—with stops anywhere in between.

"VP" offers you a clear, flat field, devoid of aberrations at any magnification. You have all the power required for the longest sight, and reduced power for local conditions.

You will find visibility under poor lighting can be improved by use of lower magnification. Turbulent effect of heat waves is minimized with lower power. Ask your dealer to show you the Gurley level with Variable Power. Or write for further information.

GURLEY

Surveying and Scientific Instrument Makers Since 1845

W. & L. E. Gurley, Fulton & Station Streets, Troy, N. Y.

Surveying and Engineering Instruments, Hydraulic Engineering Instruments, Standard Precision Weights and Measures, Paper and Textile Testing Instruments, Reticle Making Facilities, Aeronautical Navigating Instruments, Meteorological Instruments.

Improved Electrode To Weld Mild Steel

■ A large amount of powdered metal added to the coating of a new electrode is said to make it possible to weld mild steel considerably faster than with conventional electrodes. The powdered metal used in the Airco Easyarc 12 electrode changes the arc action so that welds can be made by dragging the electrode in contact with the plate. The faster welding is achieved because the metal powder becomes part of the weld bead. Weld spatter is decreased to less than half that occurring with regular electrodes, according to the manufacturer.

The weld beads are said to be exceptionally smooth, and the weld metal is of high strength, good ductility, and excellent X-ray soundness. The new electrode is recommended for the fabrication of mild steel involving plate and rolled sections.

For further information write to the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 30.

Data on Roller Bearings

■ Dimensions, load ratings, and application data for its roller bearings are given in literature from the Hyatt Bearings Division, General Motors Corp., P. O. Box 476, Newark, N. J. The booklet describes the company's Hy-Load solid roller bearings, wound roller solid-race and split-race bearings, and the 70,000 series industrial inch bearings designed for large-diameter shaftings in heavy equipment where fractional dimensions are the rule.

Detailed drawings and cutaway views show the working parts of the bearings. Tables give complete specifications on sizes, ratings, and other data.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 101.

There is a GM Diesel Engine Distributor Near You

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ARMSTRONG EQUIPMENT CO.

ARIZONA—Phoenix
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THE EARLE EQUIPMENT CO.
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W. VIRGINIA—So. Charleston
So. Fairmont, Bluefield
RAY C. CALL COMPANY

WASHINGTON—Seattle 9
EVANS ENGINE & EQUIPMENT CO., INC.
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WISCONSIN—Milwaukee 8, Rice Lake
DROTT TRACTOR CO., INC.

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GM DIESEL
CASE HISTORY NO. 537-1

USER: John Arborio, Inc., Poughkeepsie, N. Y.
INSTALLATION: 18 GM Diesels powering Euclid bottom- and rear-dump trucks, Allis-Chalmers HD-5 and HD-20 tractors on Palisades Interstate Parkway Project, New York.

PERFORMANCE: Supervising Mechanic Seeley Pellew reports GM Diesels get more work done with less downtime. One "Euc" ran almost two years between engine overhauls. An A-C HD-20 has operated 2400 hours with no repairs to date.

It pays to STANDARDIZE on
...available in more than 750 models of equipment built by over 150 manufacturers

GM GENERAL MOTORS DIESEL POWER

"YOU CAN'T BEAT GM DIESEL POWER FOR THIS KIND OF WORK"

That's what Mr. Pellew says of his 18 General Motors Diesel-powered units on this highway construction job. He adds, "We get more work from our rigs with less downtime because GM's 2-cycle design reduces engine vibration."

GM 2-cycle Diesels accelerate faster under load because 2-cycle design gives power on *every* piston downstroke, not on every *other* downstroke as in 4-cycle engines. Starting at the push of a button, GM Diesels use efficient "unit" fuel injectors that eliminate troublesome high-pressure fuel lines. And with the scavenging blower delivering a surplus of fresh air to the cylinders, there's more complete mixing of fuel and air—better combustion—more work from the same amount of fuel.

Ask any GM Diesel owner. He will tell you that GM Diesels boost production and cut costs. For the full story of the savings you can make, call in your nearest GM Diesel distributor.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines... 16 to 300 H.P. Multiple Units... Up to 840 H.P.

Contraction Joints Sawed On Virginia Test Road

First analysis shows the joint will give good performance, is economical, and will control cracking and spalling

Where the road curved, the saw operator took advantage of the superelevation and worked from the outside to the inside. The hose on the pavement leads to the tank truck which supplied water for the saw blade.

"THE SMOOTHEST concrete pavement tested in Virginia to date," said the field engineer when he saw the results of a road-roughness test on a section of pavement where sawed contraction joints had been substituted for the usual formed dummy joints. Specifications for the joints were written into the regularly advertised project as a special provision by the Virginia Department of Highways. The test road is in central Virginia on Route 360 near Burkeville in the Amelia Residency. Results on the 0.924 mile of wire-mesh reinforced-concrete pavement are considered so encouraging that additional concrete paving projects containing sawed joints will be let in Virginia in the coming road-building season.

Not a New Idea

The idea of sawing contraction joints is not new. Joints recently cut in concrete in Kansas and California have yielded good results. The technique is believed to have been used in Germany about twenty years ago. This type of joint, in addition to providing the road with better riding quality, makes for improved performance and economy. It also eliminates spalling and controls cracking.

In the test section job in Virginia, joints were spaced 50 feet apart, a standard currently used by the Virginia highway department. No expansion joints were specified for the job, and it was decided to use the conventional ¼-inch formed joint along the center line. The project was divided into three sections: Section 1 contained joints sawed into the continuously wire-mesh-reinforced pavement, Section 2 contained joints sawed over dowel bar assemblies, and Section 3 contained standard formed dummy joints over dowel bar assemblies. The latter section was used as a reference for the entire project.

The 8-inch-thick slab was sawed with a power-driven diamond blade 0.145 inch thick. The nominal size of the cut was ⅛ inch in width and 1¾ to 2 inches in depth. These shallower cuts are economical, provide more aggregate interlock, and satisfactorily control cracking. They are felt to be better than cuts made under the old rule that required the plane of weakness to be one-fourth the depth of the slab.

The saw was lined up with accurate crayon marking to obtain straight cuts at right angles to the longitudinal joint. In the first section, exact locations were computed by triangulation. In Section 2, small cuts were etched in the forms when dowel assemblies were placed, and

"We solved this problem by eliminating 5 different oils"

Here is the case of a large Pennsylvania contractor, so thoroughly mechanized that even his wheel-barrows were gasoline powered. And strangely enough, this intense mechanization was the root of the company's problem. Too many different types of oil were resulting in confusion and *misapplication*.

On one of his periodic visits, Sinclair Lubrication Engineer Harry Donovan was asked for his recommendations. Mr. Donovan reports, "It was plain that the perfect solution would be *one oil* suitable for heavy duty diesel, medium duty gasoline and light duty air-cooled engines.

Mr. Donovan continues, "I suggested SUPER TENOL®, knowing from previous experience that it would offer maximum protection against cold engine sludge in the lighter operations . . . and provide the necessary film strength and anti-oxidant qualities needed in the heavy duty diesel operations. The company accepted my recommendation and *eliminated 5 different oils*. Moreover, SUPER TENOL has prevented any further confusion or misapplication of oil."

SINCLAIR LUBRICANTS

Why not give a Sinclair Lubrication Engineer the chance to help solve your lubrication problems. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

a crayon line was drawn through them.

Cutting

After the operator mastered the technique of cutting the slab, the job took about 12 minutes, an average of 2 feet per minute. A water truck supplied water to the blade to lengthen its life and make the job efficient and easy. However, the hardness of the river gravel used as aggregate was reflected in the limited amount of footage sawed with each blade. Blades cut an average of about 20 joints. This totaled 487 feet, or 852 inch-feet, of cutting.

With the cost of the blades at $165 each, the total cost of using the saw, including gas, oil, and amortization, came to 55 cents per hour. Coupled with costs for labor and water truck rental, the cost of sawing a 24-foot joint came to about $12.50, an average of 30 cents per inch-foot. The cost would be approximately the same for a private contractor as it was for the highway department—about 0.75 per cent of the paving expense.

Cracking

A minor amount of transverse cracking took place in Section 1, but this was not attributed to lack of dowels or to continuity in the mesh. It is believed that operators' lack of experience in making the cuts was responsible. Six of the seven cracks in the 1,665 feet of continuous pavement occurred between the last cut at the end of a day's operations and the construction joint just ahead. Cracking always took place during the first night after paving and on concrete placed in the morning. Concrete which set during the hottest part of the day cracked erratically—if not controlled by sawing—during the coolest part of the night.

All joints made under these conditions were found cracked open to the subgrade the morning after concrete was placed. To avoid this, it was specified that concrete placed during the hottest part of the day must be sawed the same day. The remainder was to be cut before noon of the following day. When this was done, erratic cracking disappeared.

A determining factor in time allowed between the laying of the slab and sawing was found to be climatic conditions. On a hot, dry, windy day, a time lag of six hours was sufficient before sawing was started. White waterproof kraft paper was specified on the project during curing.

Performance

While it is still too early to draw conclusions as to the performance of the sawed joints, observations of the three sections have yielded interesting information thus far. Joint spalling was first observed on the reference section shortly after it was opened to traffic, while Sections 1 and 2 appeared to be in good condition. To date, roughness of the pavement expressed in inches of vertical displacement per mile travelled is lower for Sections 1 and 2 than for the reference section. Section 1, in turn, is lower than Section 2. The road beyond the west end of the project showed the largest amount of vertical displacement, while the section adjacent to the east border compared with Section 2.

In addition to determining roughness in inches per mile computed on the road-roughness machine, a graphical record was also obtained. This was the first attempt made by the Virginia Council of Highway Investigation and Research to secure visual evaluation of the pavement profile by means of electronic equipment.

On the basis of test results, sawed joints will be called for in specifications for additional concrete paving projects in the state. It is expected that at least two projects will be advertised carrying temporary special provisions covering spacing of joints, depth and width of cuts, timing of sawing, and curing as drafted by the Council of Highway Investigation and Research.

Joint spacing may be reduced to 30 feet for one of the projects to study the possibilities of decreasing the weight of steel used for wire-mesh which, in this case, would not be accompanied by an increase in road roughness often found in short-slab pavements. Data compiled on the experimental job to date is only preliminary; seasonal performance and roughness surveys must continue before a full evaluation can be made.

Personnel

The test project was undertaken by the Virginia Department of Highways. L. B. Ward was resident engineer; R. M. Lyon, district materials engineer; and P. W. Snead, district engineer. T. F. Loughborough and J. V. Clark are construction and assistant construction engineer, respectively, for the Department of Highways. C. S. Mullen is chief engineer and deputy commissioner, while J. A. Anderson is commissioner. THE END

Le Roi Division Appoints

The Cleveland Rock Drill Division of the Le Roi Co., Cleveland, Ohio, has appointed Joseph A. Bogan director of public relations. Prior to joining Le Roi, Mr. Bogan was with Bituminous Coal Research, Inc.

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When digging conditions are rough...

on small jobs or large... men who know

specify Hendrix Dragline Buckets

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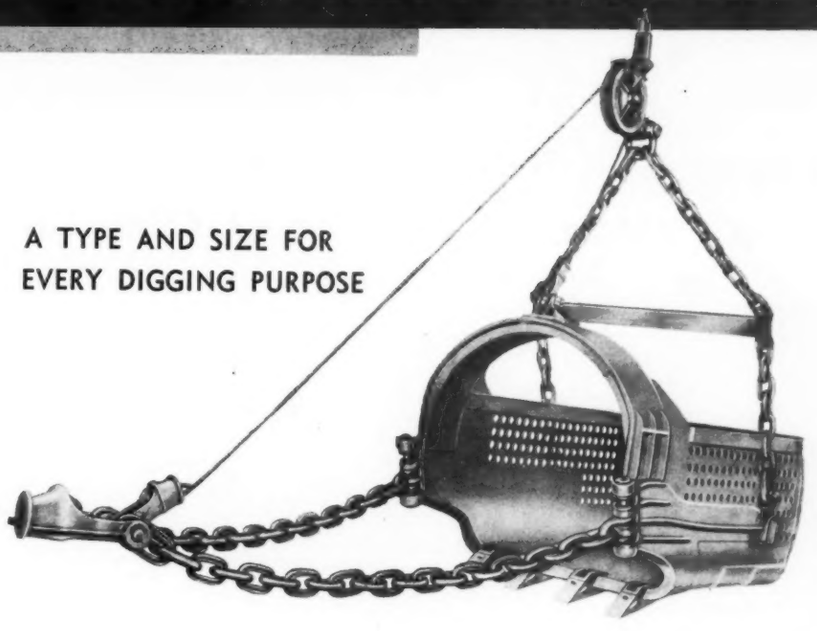


A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

3/8 to 40 Cubic Yards

Hendrix Lightweight Dragline Buckets

Hendrix Buckets available without perforations on special order.

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Don't Gamble—

Know When And How to Shore a Trench

DESPITE THE RECENT progress that has been made in decreasing the often serious and sometimes fatal accidents caused by trench cave-ins, some contractors are still not taking the proper precautions. There are two basic questions to be answered about every trench job: How deep can the trench be excavated without wall supports? If supports are needed, what type and size should be used?

The first question is the tough one, because there is no standard rule. Every job must be treated as an individual problem. But it doesn't have to be all guesswork. Engineers know that the depth to which a vertical embankment can be cut without danger of sliding is a constant multiplied by the compressive strength of the soil. A good rule-of-thumb formula is $H_c = 1.33\ P_c$, where H_c is the maximum stable depth of cut, and P_c is the compressive strength of the soil.

Field Investigation

Contractors usually shy away from formulas, but there is an easier way to determine the value of P_c in the field. Cut an undisturbed sample of the soil 1 inch square and 2 inches long. Stand it up, place a can or bucket on top, and slowly add sand to the bucket. When the sample shears or breaks, take the bucket of sand off and weigh it. The weight is the value of P_c, which can then be put into the formula to solve for H_c, the allowable depth.

This "short" method has been developed by Robert L. Moore, director of the Technical Engineering Division, Safety Engineering Department, Lumbermens Mutual Casualty Co.

Naturally, H_c is only a guide, and must be adjusted after considering the following factors.

1. Heavy rainfall, alternate freezing and thawing, seepage, and overflows will all cause damage to the walls and increase the possibility of slides. Jobs that were safe when started can easily become hazardous when affected by water.
2. Vibrations arising from equipment, traffic, blasting, or pile drivers can weaken soil structure. The proximity to building foundations, curbs, and poles may require the use of shoring to prevent the dislocation of soil.
3. Time is also an important factor. When the cut is made, the embankment expands toward the cut and deforms with a settlement of the ground surface. This throws the top of the embankment in tension, and here is where time becomes important. If the utility is installed rapidly enough, the tension may stay intact. If the surface has time to dry out, however, tension cracks will occur and reduce the stability of the embankment. Tension cracks can be good signals for the contractor to immediately install supports.

Shoring

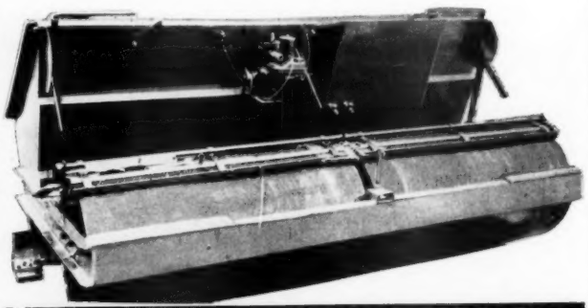
If shoring is needed, the problem is to design the proper type. Here it should be remembered that the cross braces must be increased in cross section to maintain rigidity as the width of the trench increases.

The position of the cross bracing will be partially determined by the type of soil. With a soil having enough cohesion to act as a solid, the side pressure reaches a maximum at about one-half the depth of cut. Dry granular or saturated soils, however, increase in side pressure in proportion to the depth of cut.

Minimum recommendations for trench timbering are given in Data Sheet D-Con 2, published by the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

There are several other recom- ▶

PAVING PROFITS GO UP!



OVERMAN'S STONE AND BITUMINOUS SPREADER

It is a simply constructed paver—no heavy expensive controls or machinery, no complicated operation; yet it will do the work faster and better than other pavers costing several times as much. New dual vibrator assures free-flowing delivery of material from hopper to pavement; gives faster, smoother action. Quickly attached towing hitch allows it to be moved between jobs by truck at regular driving speeds.

Your BEST BUY for price, quality and speed. Increase your profits on paving contracts. Get the facts—prove it for yourself.

Write for bulletin today.

I. J. Overman Mfg. Co.
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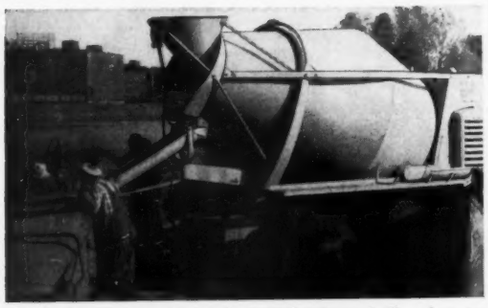
TRANSCRETE AVAILABLE IN 3 TO 6 YARD CAPACITIES



CMC's Transcrete — the simplest truck mixer of all — features the famous "Thoro-Mix" action that charges, mixes, and discharges all slumps faster.

Large drum diameter, deep "L" section blades and a progressively increasing blade slope are drum design features that make for more thorough mixing, more positive discharge, and a greater ability to handle stiff, low slump mixes.

Transcrete's time saving efficiency means more trips per day as mixer or agitator.

Quality construction and simplified rugged design assure trouble-free life.

Transcrete offers you the choice of a profit making size at the price you want to pay.

CMC OFFERS LARGE VARIETY OF BATCHING EQUIPMENT

CMC's Multiplex Bins fill a long apparent need for a more compact, lower-in-height bin for central plants and many other installations.

They are available in unit construction 16' square — 2, 3 or 4 compartment, 100 or 150 ton, with or without 125 or 175 bbl. center cement compartment, elevator or conveyor.

Interchangeable legs and braces make ground assembly quick, easy. They can be erected in just a fraction of the time usually required.

Batchers are available in 1, 2, 3, 4 or 6 yard sizes with or without cement compartment.

Other Outstanding Batching Equipment

CMC also has Bin Batchers for smaller jobs; cement bins, cement batchers, manual or automatic; automatic water weighers; conveyors and elevators to fit into your present plant.

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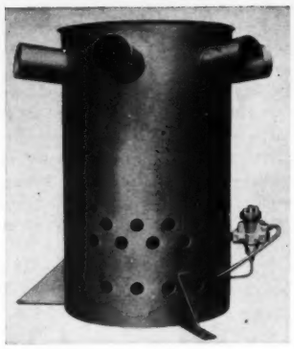
CONSTRUCTION MACHINERY COMPANIES . . . . . WATERLOO, IOWA



The Heatorama space heater.

Portable Space Heater Has Six Duct Outlets

■ A portable space heater fueled by liquid petroleum or natural gas is being distributed nationally by Weldit, Inc., 999 Oakman Blvd., Detroit 6, Mich. A feature of the Heatorama space heater is its six 3-inch open-end pipes for directional heat flow. The heater can be used singly or in batteries for large areas. Generating 50,000 Btu at 6½-ounce pressure, the heater is suitable for the protection of plaster, cement, and concrete construction during cold weather and will increase the comfort and efficiency of workmen on the job. Its directional-heat feature permits pipe runs to adjacent areas. The new unit is equipped with a barber impinged jet burner.

Weighing 30 pounds, the space heater can be set on the floor or suspended with wires. It is equipped with a Honeywell C-585 pilotstat with a safety shutoff. It is stressed that the heater burns without smoke, fumes, or ashes.

For further information write to the company, or use the Request Card at page 18. Circle No. 13.

Booklet on a Chain Saw

■ A catalog that illustrates and describes the new chain saw made by the Bolens Products Division, Food Machinery & Chemical Corp., Port Washington, Wis., is now available. The bulletin details new features of the Bolens saw.

Six available guide-bar and chain attachments are listed, including a bow saw. Also discussed are the design, construction, and operation of the chain saw's basic engine unit. The manufacturer's engine-replacement plan is described.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 115.

(Continued from preceding page)

mendations for safe trench excavating worth remembering. Braces should not be used to support platforms for heavy equipment. Sheeting should project at least a foot above the top of the vertical banks to prevent material from falling into the trench.

Cross braces should be screw jacks or timbers cleated and rigidly wedged. It is desirable to have at least one ladder for every 100 feet of trench. Excavated material should not be placed nearer than 18 inches from the sides of the trench. Men working in trenches should wear hard hats and safety shoes. THE END

Lightweight Sections Of Structural Steel

■ A new line of lightweight studs, joists, and accessories for steel framing is illustrated in literature from Penn Metal Co., Inc., Parkersburg, W. Va. Several new sizes have been added for framing residences, schools, hospitals, light commercial and industrial structures, exterior curtain walls in multiple-story buildings, and other structures in the field of light construction.

The catalog gives complete specifications, engineering data, and safe loads for all stud and joist sections. Illustrations show how wall panels can be shop-assembled for erection at the site.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 19.

"Here's the clamshell, caterpillar, and crane you've been yelling for."

ALLIS-CHALMERS INVITES YOU TO . . .

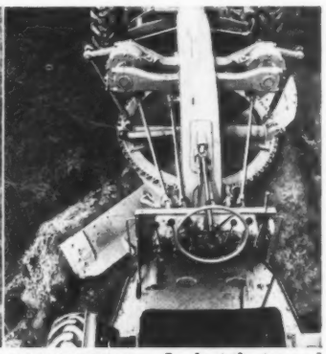
Look at your Grader Jobs

THROUGH THE EYES OF AN AD-40 OPERATOR . . .

GRADING — Look at that single member frame — it really lets you see what you're doing . . . means efficient grading on *any* job.

SLOPING — Look how much better you see . . . how much steadier your blade is with small control rods leading out to lift cases located directly over the circle.

DITCHING — Look at the low control panel. It gives you a clear view of the blade . . . helps insure a clean, smooth ditch.



SOD STRIPPING — Look at the tapered corners on this clean, wide platform . . . how they give unequalled view of heel of ROLL-AWAY moldboard.

In addition to letting you see better, the AD-40 offers feather-touch hydraulic power steering, hydraulic brakes . . . and true comfort for any size operator, sitting or standing. *Look!*

Yes, the big, new AD-40 is designed for today's jobs and today's operators . . . brings new standards of performance to all users of motor graders . . . handles all grading jobs faster, better, easier. You owe it to your operators . . . and yourself to ask your nearby Allis-Chalmers dealer now for a demonstration and *see for yourself.*

ROLL-AWAY is an Allis-Chalmers trademark.

- 104 bhp. • Six speeds forward, three reverse
- 23,000 lb. (with optional calcium chloride solution in rear tires — 24,800 lb.).

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

New Sickle Grinder For Roadside Mowers

■ With the use of a standard field mower for roadside maintenance, frequent sharpening of the sickle blade is necessary to maintain the desired cutting efficiency. Lantz Mfg. Co., Inc., P. O. Box 124, Valparaiso, Ind., has recently announced a new sickle grinder whose grinding stone is mounted on a swinging arm which can be moved back and forth toward the sickle bar to grind in both directions. This in and out movement of the grinder toward the stationary sickle bar is said to give a more uniform cutting surface.

The unit handles sickle bars from 1 to 7 feet in length. Available with or without an electric motor, it can also be equipped with a ¾-hp engine for shop or field use. Two stones are available to grind sickles of varying point angles.

For further information write to the company, or use the Request Card at page 18. Circle No. 37.

NRMCA Publications

Two new publications are now available from the National Ready Mixed Concrete Association, 1325 E St., N. W., Washington 4, D. C. "Specifications and Test Methods for Ready-Mixed Concrete" consolidates the standards of the NRMCA, the Truck Mixer Manufacturers Bureau, and the American Society for Testing Materials, together with NRMCA's "Recommended Practices for Sampling and Testing Ready-Mixed Concrete" and relevant ASTM test methods.

Copies of the booklet, Publication No. 47, are available at 40 cents each. At a slight additional cost per copy, firms may have their names imprinted on the front cover. A "library edition", bound in a regular book cover, is priced at $1.00.

Publication No. 49, "Is Ready-Mixed Concrete Dependable?", is a stenographic transcript of a talk given before the Concrete Industry Board in New York City recently. It is also available at a nominal cost

Lima Names Sales Manager

Appointment of W. D. Ellis as manager of South American sales for Lima shovels, cranes, draglines and pull-shovels, has been announced by the construction equipment division of the Baldwin-Lima-Hamilton Corp., Lima, Ohio. Mr. Ellis will make his headquarters in Sao Paulo, Brazil.

Long-Lasting Battery Works in Extreme Cold

■ A new storage battery less than half the size of conventional batteries and with a life expectancy reported to be five times that of standard batteries is announced by the Sonotone Corp., Elmsford, N. Y. The Sonotone battery uses nickel-cadmium cells of a special sintered-plate type. Among its immediate applications, as listed by the company, are heavy construction and hauling equipment, trucks, cars, diesel motors, and communications equipment.

The battery uses an alkaline solution instead of acid and requires only a few drops of water a year. It will operate at temperatures as low as 65 degrees below zero, and as high as 165 degrees F, according to the company. Because of its all-weather operation, equipment standing overnight or for long periods in freezing weather will start up immediately at the touch of the starter button. Its construction also makes the battery impervious to shock and vibration, and the cells can be used in any position including upside down.

The manufacturer explains that while the initial price of the battery is two to five times that of the conventional type, the cadmium battery will last so much longer that the actual cost is considerably lower.

A further characteristic of the battery is that it can deliver large currents in proportion to its size because of its extremely low internal resistance. This means new adaptability for hard-to-start motors and engines.

For further information write to the company, or use the Request Card at page 18. Circle No. 113.

March Is Red Cross Month!

Here's news for YOU!

The BMCO Rock Buster preparing oversized rock for use on a road base.

Portable Rock Breaker

■ A new portable rock breaker that reduces oversized rock in pit-run material to the sizes best suited for macadam or asphaltic road base, and does it right on the roadway, is announced by the Lewis-Browning Mfg. Co., P. O. Box 2707, San Antonio, Texas. The BMCO Traveling Rock Buster is a multiple-hammer-type machine equipped with 18 to 36-pound hammers rotating at the rate of 1,000 rpm. It is powered by a 90-hp diesel engine. The machine is steel armored for safety against flying rock.

Gravel and various forms of rock with their binder may be dug from their natural formations with power shovels, loaded into trucks, and dumped directly on the roadway in continuous piles. A motor grader then blades off a windrow suitable in size for the 4-foot-wide and 2-foot-high throat of the Rock Buster so it can be towed astride the windrow to reduce the oversize and blend with the natural binder. The motor grader then follows the machine, moving the blended material over further to the edge of the base area and thereby providing space for the next windrow of unbroken material.

This cycle reduces all oversized rock and blends it with binder material ready for the final blading and shaping of the road base.

For further information write to the company, or use the Request Card at page 18. Circle No. 26.

ANNOUNCING

MICHIGAN

TRACTOR SHOVELS

. . . from engine to tires Power Transmission engineered and manufactured by Clark

Faster, heavier, with greater horsepower than any tractor shovels of comparable capacity, MICHIGAN* Tractor Shovels move material faster, last longer and cost less to operate! Check these vital mechanical superiorities . . .

Clark Torque Converter
Clark Power-Shift Transmission
Clark Planetary-Wheel Axles
Hydraulic Steering Booster
Low Level Bucket Tip-Back
Short Turning Radius
High Tractive Ability
Four Speeds Forward
Four Speeds Reverse
Lights — Standard Equipment
Double-Acting Lifting and Dumping Cylinders
Gasoline or Diesel Engine

Six Models . . . To Fit Every Need

Model 12-B—1½ cu. ft.	bucket drive, rear steer
Model 75-B—1 cu. yd.	bucket drive, rear steer
Model 75-R—1 cu. yd.	rear drive, bucket steer
Model 75-A—1 cu. yd.	all-wheel drive, rear steer
Model 125-A—1½ cu. yd.	all-wheel drive, rear steer
Model 175-A—2¼ cu. yd.	all-wheel drive, rear steer

For Full Information . . .

All the facts concerning these important new machines are assembled in the MICHIGAN Tractor Shovel FACT-FOLIO—a handy and useful file containing specifications and action photographs. The coupon will bring your copy.

*A Trademark of Clark Equipment Company

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division 384, Second Street BENTON HARBOR, MICHIGAN, U. S. A.

Please send the MICHIGAN Tractor-Shovel Fact-Folio

Name_____ Title_____

Firm Name_____

Address_____

City_____ Zone_____ State_____

Bonding Additive For Asphalt Paving

■ A new bonding additive for asphalt cement and hot mixes, which is not destroyed when handled, transported, and stored in asphalt-road materials at the high temperatures required, has been announced by the Carlisle Chemical Works, Inc., Reading, Ohio. The manufacturer reports that in heat-stability tests in asphalt, the additive, Pave, withstood constant temperatures of 350 degrees F for weeks without loss of bonding effectiveness.

It is reported that in many asphalts the additive was more stable than the asphalts themselves. The product is equally effective with asphalt cement, cut-backs, emulsions, and invert emulsions. The stronger bond prevents water-creep between asphalt and aggregate in finished roads to reduce peel-off of asphalt. The manufacturer states that where wet conditions are found in road laying and in topping and patching, road materials treated with the additive displace moisture from the surface of the aggregate to allow the asphalt to bond tightly to the aggregate.

For further information write to the company, or use the Request Card at page 18. Circle No. 112.

Lugs Add Traction Power

■ Tractor wheel lugs that increase the traction of rubber-tire tractors are described in literature from the Baraboo Mfg., Inc., Baraboo, Wis. The folder illustrates the lugs in an upright ready-to-use position with the lug ring attached to the tractor wheels. When not needed, the lugs are folded in towards the center of the wheel. The lugs flip out and automatically lock in place for use.

Advantages include increased tire life through the elimination of excessive tire wear due to spinning and slipping. Drawbar horsepower is markedly increased, according to the manufacturer. The lugs do not touch the tires.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 94.

Distributor Doings

At its recent convention in New York City, the Associated Equipment Distributors elected George W. Gagel (at left) president of the association, and Ray J. Finn (at right) executive vice president for 1954. Mr. Gagel is president of Machinery & Supplies Co., Inc., Kansas City, Mo. Mr. Finn is president of the Bode-Finn Co., Cincinnati, Ohio.

MANAGEMENT AND SALES problems shared the spotlight with distributor-manufacturer conferences at the 35th annual convention of Associated Equipment Distributors in New York City. Over 2,800 representatives of the construction-equipment industry attended the four-day meeting held January 31 to February 4 at the Waldorf-Astoria Hotel.

Virtually all of the sessions were devoted to evaluating the changes expected in 1954, and determining new ways of cutting costs and increasing sales. Speaker after speaker emphasized that the country is heading into a period of healthy adjustment during which a maximum sales effort must be made.

Even the perennially pessimistic economist, Leo Cherne, spoke enthusiastically about the American economy in the years ahead. He predicted that unless fear and panic cause the public to retreat into their bank accounts, 1954 should be the second best year this country has ever experienced. "The one word into which these months are compressed is sales," Cherne said, adding that sales is the "heart of enterprise, the miracle of America's output, the secret behind a fantastic consumption, . . . "

Management Report

Better sales planning and profit control were emphasized in a report by Norris Perris, a partner of the industrial management firm of Stevenson, Jordan & Harrison. After investigating the construction-equipment distributor industry for more than a year, the firm reported a number of ways in which distributors may lose money:

1. With a poorly integrated line of products, distributors may be forced to sell through several groups of outlets.

2. Through the uneconomical maintenance of a complete line in

Equipment Distributors Discuss Efficient Selling

every territory, whether the territory requires it or not.

3. Through a management which does not know the true cost of selling and servicing each line of equipment.

4. With inadequate supervision of salesmen.

5. By maintaining price policies that are not sensible.

6. With selling and advertising programs that are uncoordinated.

Perris also pointed out that in this era of keen competition vigilant sales managers should conduct market studies to determine:

1. The number of buyers in each territory by categories.

2. The needs of each type of buyer by product, performance, and service.

3. Buying habits.

4. Methods and position of competitors.

5. Relative position of the distrib-

(Continued on next page)

The three recently elected vice presidents of the Associated Equipment Distributors, from left to right: S. F. Laskey, president of Northwestern Equipment, Inc., Fargo, N. Dak.; L. Miner Doolen, vice president and treasurer of Telford Equipment Co., Lansing, Mich., and R. S. Hamilton, who was also made director of Region XV of the AED. He is sales manager of Sheridan Equipment Co., Ltd., Toronto, Canada and president of the Canadian AED. At the far right: F. J. Fitzpatrick, re-elected treasurer of the AED. Mr. Fitzpatrick is president of Parker-Danner Co., Hyde Park, Mass.

Distributor Doings

utor and his line.

Sales Training

A. N. Seares, vice president of Remington Rand Inc., reiterated what had been said on the growing importance of selling during 1954,

Bud McCune, Flack Equipment Co., Dayton, Ohio.

Dave Griffin, Griffin Equipment Co., New York, N. Y.

and placed responsibility on sales managers to develop, educate, inspire, and motivate salesmen so that they attain professional levels in the industry. Recent surveys show that sales training is the top problem of today's managers.

Better cooperation between manufacturers and distributors was advocated by several speakers. Dr. Charles Reitell, also of Stevenson, Jordan & Harrison, explained that the period is now over in which the manufacturer develops new products and then tries to force them on the industry. Today, the distributor must keep in close touch with the equipment user to determine the user's needs and relay them to the manufacturer.

Officers

George W. Gagel, Machinery & Supplies Co., Kansas City, Mo., was elected 1954 AED president. He succeeds S. John Oechsle, Metalweld, Inc., Philadelphia, Pa. Mr. Gagel, executive vice president in 1953, has been chairman of AED's Planning

G. Carl Achtenhagen, GCA Tractor & Equipment Co., Milwaukee, Wis.

and Promotion Committee since 1948. He was president of the Equipment Distributors Association of Greater Kansas City in 1945.

The new executive vice president is Ray J. Finn, president of Bode-Finn Co., Cincinnati, Ohio. He previously served as vice president and member of the board of directors.

The three vice presidents are S. F.

Ed Harman, E. W. Harman Co., Columbus, Ohio.

Jerry A. Frost, Jr., Michigan Tractor & Machinery Co., Detroit, Mich.

Laskey, Northwestern Equipment Co., Inc., Fargo, N. Dak.; L. Miner Doolen, Telford Equipment Co., Lansing, Mich.; and R. S. Hamilton, Sheridan Equipment Co., Ltd., Toronto, Canada. F. J. Fitzpatrick, Parker-Danner Co., Hyde Park, Mass., is treasurer.

P. D. Hermann, executive secretary of the AED, announced the appointment of Frank Skidmore as director of industry relations, a new position made necessary by the association's development of an enlarged program of industry relations and membership services.

Wilson Lewis, H. W. Lewis Equipment Co., San Antonio, Texas.

Mr. Skidmore, formerly secretary-treasurer and general manager of Contractors' Equipment & Supply Co., Albuquerque, N. Mex., will concentrate his activities on distributor-manufacturer relations, customer relations, distributor-management methods, and other programs carried on by the association. THE END

4000 lb. capacity plant at Industrial Asphalt, Los Angeles, California

STANDARD RB ASPHALT PLANT

Easy motion type controls and scales are located so as to provide a minimum of movement and effort by the operator.

Standard Asphalt plants are *used internationally* on the basis of superior performance. Contractors know that the Standard reduces costs for three reasons: 1. Dependability; 2. Greater capacity; 3. Smoother all-around operation. From extra large dryer capacity to oversize elevators, *balanced flow* assures economy, smooth operation and high capacity. Write today for the location of the Standard Plant nearest you and *see for yourself.* Study the RB's advanced features and you'll realize Standard builds the most modern asphalt plant.

Unit built in seven sizes—1000 to 6000 pounds batch capacity

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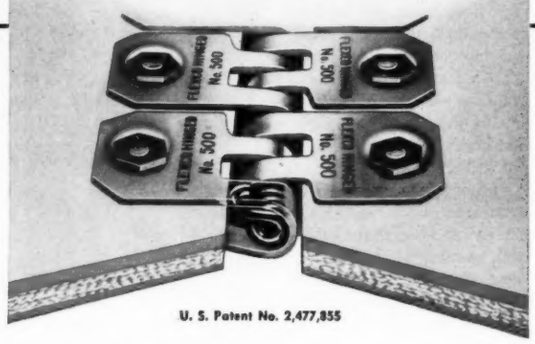
... the new separable

FLEXCO HINGED BELT FASTENERS



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- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4608 Lexington St., Chicago 44, Ill.

Distributor Doings

Distributor for Koehring

One of the largest construction equipment distributors in the midwest, Gil Boers Equipment Co., Inc., is now handling the full line of Koehring equipment and two lines of subsidiary equipment. In addition to the Koehring line, the company will distribute Parsons Trenchliners and Trenchmobiles and Kwik-Mix Moto-Bugs and mixers. The distributor, located at 7625 S. Kedzie, Chicago 29, Ill., will serve an area including northeastern Illinois and some counties in northwestern Indiana. Complete service will be offered on all equipment sold.

St. Paul Names Midwest Dealer

The appointment of the Chicago Hoist & Body Co., 8820 Vincennes Ave., Chicago, Ill., as a dealer for its line of hydraulic hoists and dump bodies, Pax-all compacting refuse bodies, Frate-Gate elevating end-gate, and Truck Patrol underbody road maintainers, has been announced by St. Paul Hydraulic Hoist, Wayne, Mich.

The dealer was granted exclusive sales rights to St. Paul products in Du Page, Will, Kankakee, Iroquois, and Ford counties, and the southern portion of Cook County, Ill., and in Lake, Porter, Newton, and Jasper counties, Ind.

Kewanee-Ross Distributor

Now representing the Kewanee-Ross Corp. in the St. Louis territory is Debco Equipment Co., Inc., 6219 Delman Blvd., St. Louis 5, Mo. Kewanee-Ross, located in Kewanee, Ill., makes boilers and heaters.

Dwane E. Busse is manager for the new distributor. John B. Farrow and Stanley W. Souders are its sales engineers. The firm will cover parts of the states of Missouri, Illinois, and Kentucky.

Two Gar Wood Dealers Named

Gar Wood Industries, Wayne, Mich., has appointed two new distributors. Covering the province of Newfoundland is A. E. Hickman Co., Ltd., St. John's, Newfoundland, Canada. The dealer will handle Gar Wood dozers, scrapers, and control units. Highway Equipment & Supply Co., Harrisburg, Pa., is the new distributor of Buckeye ditchers, spreaders, finegraders, and Hi-Way wideners for 32 Pennsylvania counties.

Dealers Celebrate Anniversary

Marking 50 years of service as sales agencies for the T. L. Smith Co., Milwaukee, Wis., manufacturer of mixers, Borchert-Ingersoll Inc., of St. Paul, Minn., and The George F. Smith Co., Inc., St. Louis, Mo., were honored with a banquet at the Milwaukee Athletic Club.

George L. Smith and John Borchert, representing their respective organizations, were presented with bronze plaques at the golden anniversary banquet by Harold E. Smith, president of the T. L. Smith Co.

Ryerson Is Carlon Dealer

Joseph T. Ryerson & Son, Inc., Chicago, a steel service organization, is now distributing plastic pipe and fittings produced by the Carlon Products Corp., Cleveland, Ohio. Service on the products is available through the 16 Ryerson plants across the country. Both flexible and rigid types of Carlon plastic pipe are available in a number of compositions.

Distributor for Concrete Saw

Techkote Co., Inc., Inglewood, Calif., has been appointed distributor in 11 western states for the complete line of Concut concrete saws and Foothill concrete sawing blades manufactured by Concrete Sawing Equipment, Inc., Arcadia, Calif.

The new dealer, serving the construction industry for the past 12 years, manufactures and handles concrete curing compounds, joint-sealing compounds, air-entraining agents, spraying equipment, and joint-filling application equipment.

Arrow Is Wooldridge Dealer

The Arrow Contractors Equipment Co., 4646 S. Kedzie Ave., Chicago, Ill., has been appointed exclusive dealer for earth-moving equipment manufactured by the Wooldridge Mfg. Co., Sunnyvale, Calif., throughout northern Illinois and in Lake, Porter, and La Porte counties, Indiana.

Featured in the Wooldridge line are Terra Cobra self-propelled scrapers, tractor-drawn scrapers, bulldozers, medium and heavy-duty rippers, and cable control units.

Sierra Is New Euclid Dealer

Now a distributor of earth-moving machinery manufactured by the Euclid Division, General Motors Corp., Cleveland 17, Ohio, is Sierra Machinery Co., Inc., 307 Morrill Ave., Reno, Nev. The dealer's territory includes all of Nevada with the exception of White Pine, Elko, and Clark counties. It also includes a number of California counties on the Nevada border.

Bode-Finn Is Hyster Dealer

The Cincinnati and Dayton, Ohio, offices of the Bode-Finn Co. will offer complete sales and service on industrial equipment manufactured by Hyster Co., Portland, Oreg. The machinery firm will serve as a Hyster distributor for southwestern Ohio, northern Kentucky, and southeastern Indiana.

"ON-TIME" Maintenance *cuts* "DOWN-TIME" REPAIRS!

HOBBS *Engine Hour* METERS

Remove Maintenance Guesswork

You get longer life and longer periods of trouble-free operation when you know the length of TIME your powered equipment has run. A revolution counter can't tell you — it takes a true timing instrument that records HOURS and MINUTES. The HOBBS ENGINE HOUR METER is such an instrument . . . it helps prevent breakdowns and prolong equipment life.

APPROVED BY LEADING MANUFACTURERS

Installed as original equipment and/or recommended by leading manufacturers. Get full information from your factory branch, representative or distributor . . . or write for FREE CATALOG 569.

ORIGINATED AND MANUFACTURED EXCLUSIVELY BY

John W. Hobbs Corporation

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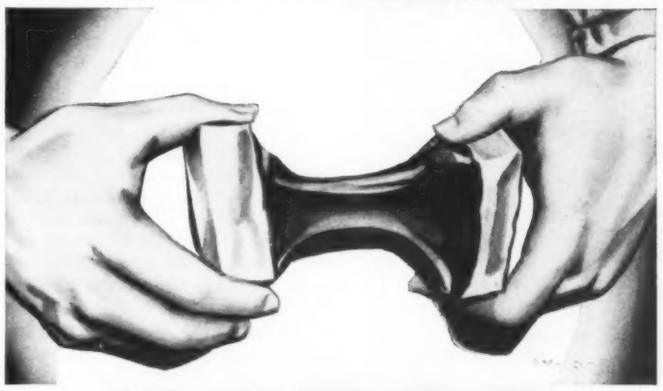
NOW! The easiest to handle Joint-Sealing Compound is also the BEST!



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RUBBER ASPHALT JOINT SEALER

☆ BETTER ADHESION!

☆ WATERPROOF!

☆ EXPANSIBLE TO WITHSTAND BOTH EXTREME HEAT AND COLD!

Kapco Rubber Asphalt Joint-Sealing Compound, manufactured in Keystone's modern Chicago Heights plant, meets Fed. Spec. SS-S-164 (supersedes Fed. Spec. SS-F-336a), also C.A.A. Spec. P-605 and all State Highway Dept. Specs. for this type of seal. It comes in 50# strippable bags designed for full protection and ease of handling.

Order separately or in combination with other KAPCO products which include famous Kapco Tongue and Groove Joint, Kapco Fibre or Fibreglas Expansion Joint, Kapco Concrete Curing Compound, etc., etc.

For your own convenience, why not order all of your asphalt road-building materials from one source!

WE GUARANTEE PROMPT SERVICE!

KEYSTONE ASPHALT PRODUCTS COMPANY

DIVISION OF AMERICAN-MARIETTA COMPANY

General Offices: American-Marietta Building, 101 East Ontario Street, Chicago 11, Illinois

Air-Base Streets Are Paved With Asphaltic Concrete

Average of 1,500 tons of material is laid daily by fast-working crew on 100,000-ton hot-mix job

Two Barber-Greene pavers each lay a lane of material. A Huber 3-wheel roller follows one of the machines to make the initial breakdown roll. *Ray Day Photo*

At The Air Force Flight Test Center at Edwards Air Force Base, Edwards, Calif., a 100,000-ton hot-mix asphaltic concrete job on 40 miles of major street and road system is proof that good advance planning cuts construction time. The paving assignment came under the expansion program at this important Air Force research base in the Mojave Desert where, in the absence of any large concentration of civilian population, flight tests of equipment, aircraft, and power plants can be carried on.

The Sacramento, Calif., contracting firms of Fredericksen & Kasler and Lowe & Watson, together with Fredericksen & Kasler and Peter Kiewits Sons' Co., did the $2,223,583 job for the Corps of Engineers, operating under joint ventures on the two contracts.

In spite of the potential difficulties inherent in a street-paving program at a defense base, paving was carried on at a sustained daily average of 1,500 tons or more, breaking a company record previously held by the Kasler organization.

From the very start, advance planning marked the expansion work at the base. The U. S. Air Force and the Los Angeles district office of the Corps of Engineers worked in close liaison on the construction agenda. Not only were the major buildings of the new addition carefully located, but a comprehensive system of streets, with special reference to drainage, good bearing value, and minimum grading, was drawn in completely. With the exception of the small 20-foot road leading into a radar station, all of the 40-mile street system was planned in increments of 11 feet. Prior to current operations, the street system was graded and given a soil-cement base stabilization. (See C. & E., August, 1953, pg. 19.)

Dense Mix; Less Maintenance

Sacrificing some pavement smoothness in the interest of greater economy, a single 2½-inch course of plant-mixed asphaltic concrete was specified for the entire project. Final results, if checked by an electronic roughometer, would show no more than 40 inches of roughness per mile. The primary desire was to emphasize a properly graded mix, adequately prepared, and compacted to high density.

This theory was carried out from pavement through cement-stabilized base to compacted subgrade in the belief that a tight, densely compacted job would reduce routine street maintenance after the base extension was finished and opened to traffic.

Corps of Engineers specifications called for 98 per cent of lab compaction in the hot-mix. This high compaction was exceeded not only in many of the straightaway sections, but even in longitudinal and transverse joints. Cores cut after the asphalt had been placed showed that compaction was up to an average of 96.5 per cent.

Specifications called for a Marshall stability rating of 500 psi plus, but most of the 265 Marshall tests made showed 1,100 to 1,200 psi. Flow characteristics called for in the mix limited that rating to 20 inches or lower.

JOYCE JACKS
for heavy duty jacking

JOYCE STANDARD SPEED, BALL BEARING, GEARED SCREW JACKS... will safely maintain heavy loads for long periods of time. They feature minute adjustment for accurate load placement . . . a toe-lift for low-lying loads . . . large rectangular base for solid footing . . . completely enclosed against dirt and weather . . . and ruggedly constructed to withstand hard usage. Available in capacities from 25 to 50 tons.

JOYCE JOURNAL JACKS . . . are widely used where a short, powerful lift is required. They are a compact, completely enclosed geared screw type jack, ideal for use in close quarters. Available with capacities from 25 to 35 tons, with malleable or aluminum alloy housings.

Joyce builds a complete line of ratchet, geared screw, hydraulic and air operated jacks . . . material lifts, freight elevators and hydraulic loading docks.

. . . write for complete information today!

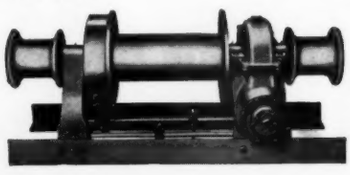
IN CANADA: Midland Foundry & Machine Co., Ltd., Midland, Ontario

JOYCE
THE JOYCE-CRIDLAND CO.
DAYTON 3, OHIO

TULSA TRUCK POWER WINCHES FOR LOADING

in construction, oil fields, public utilities and commercial hauling, the favorite time and labor saver is a Tulsa Winch. Literally hundreds of heavy and difficult jobs can be handled quickly, easily and safely with a Tulsa Winch. Heavily constructed of the finest materials, Tulsa Winches pay for themselves every day through untroubled performance. Equip your trucks and crawler tractors NOW with Tulsa Winches.

Tulsa Winch-equipped truck used by a public utility company shown loading 3-ton cable reels with a Model 23 Tulsa Winch.



Tulsa* Winch
TULSA, OKLAHOMA
DIVISION OF VICKERS Inc.
*Reg. U. S. Pat. Off.

Void total-mix limits were 3 to 5 per cent, with at least 80 per cent of voids filled with asphalt. The asphaltic cement specified was 85-100 penetration, with mix design calling for 6.4 per cent. Despite some absorption in an otherwise excellent mineral aggregate, this requirement resulted in a rich, easy-to-lay mix.

The mineral aggregate portion of the mix was set within close tolerances to the following general requirements:

Sieve Size	Per Cent Passing	Specifications
¾-inch	100	100
½-inch	96	86–100
⅜-inch	84	70–84
No. 4	63	55–67
No. 10	48	40–54
No. 20	36	...
No. 40	25	22–31
No. 80	15	12–20
No. 200	6	4–8

A complete field laboratory was set up so that these design requirements could be checked at field level while the work was in progress. Most of the main field lab equipment was housed in a trailer, but for some time one wing of an office building was also occupied by the technicians. The laboratory was completely equipped with shaker screens and outfitted with Marshall testing equipment, including sieve analysis for soil aggregates and density sampling equipment.

Close correlation was established by checking the hot-plant bins daily. The results of this checking were then correlated with the gradation formed in the oil-extracted sample so that control could be extended over the job-mix formula.

Aggregate Produced Locally

Securing mineral aggregate threatened to become a problem at the planning stage of the job, but after considerable field study and sampling, a deposit of excellent material was found six miles from the center of the work, and the property was purchased outright. The rock was of volcanic origin with an average specific gravity of 2.63, somewhat lighter than that customary in the locality's rock deposits.

The material showed a favorable tendency to break with many fractured faces, and the resulting interlock effect lent a positive measure of strength to the asphaltic mix. The rock showed up durably in the Los Angeles Rattler Test, losing only 12 to 14 per cent of its volume. Later, this durability factor slowed the rock crushers' work slightly.

The single rock-production setup allowed one Caterpillar tractor with a U-type dozer to handle the entire plant feed assignment largely by gravity. The plant was set up at a low point from the native deposit as soon as wagon drilling and shooting were finished. The formation was loosened by loading 2½-inch drill holes with 40 per cent Hercules granular powder, then touching off heavy shots.

The rock-production plant was divided between a primary and sec-

(Continued on next page)

This Standard asphalt plant was set up for the Edwards job six miles from the center of the work. *Ray Day Photo*

send for this catalog describing acker's new all-purpose digger

Send the coupon today for your copy of our new catalog showing the wide range of application as well as the many exclusive features that make the *Acker All-Purpose Digger* the most versatile and useful you can buy!

TWO MODELS TO CHOOSE FROM — Jeep mounting with compact, power take-off or skid-mounted with self contained power plant for truck mounting.

ACKER DRILL CO., Inc.
725 W. Lackawanna Avenue, Scranton, Penna.
Please send me free copy of Bulletin 40. C&E

Name_____ Title_____
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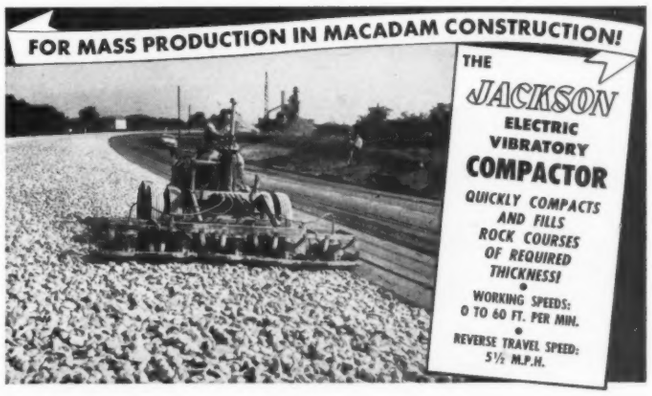
FOR MASS PRODUCTION IN MACADAM CONSTRUCTION!



MACADAM The JACKSON — in one pass — will sufficiently compact 12 inches of rock to support smooth rollers. In four passes, the JACKSON keys and compacts to final density. It takes just two passes for the JACKSON to completely fill voids from top to bottom of the course, when enough dry fines are spread on top in one application.

IN GRAVEL SUB-BASES (Blanket Course) 7" thick, at optimum moisture, the JACKSON in one pass has obtained densities exceeding 100% Standard Proctor. Vibratory frequency may be varied to suit conditions.

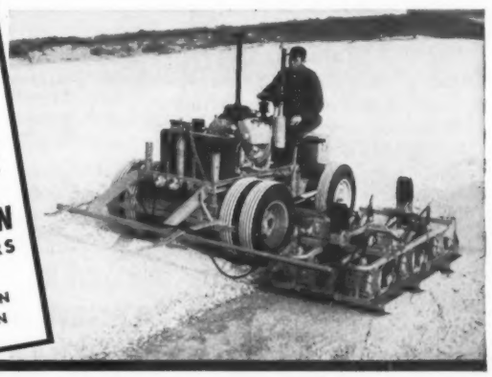
FLEXIBLE The JACKSON is available in a standard width of 13', 3". Units may be subtracted on the job to meet conditions requiring narrower widths. The 26" units can be detached and fitted with handles, providing self-propelled compactors for restricted areas, pavement patching, paving drives, compaction of granular soils in trenches, etc.

WIDENING STRIP COMPACTED IN ONE PASS

With simple equipment available, compactors may be assembled in tandem, 3 deep and in single or double row, and towed at the side of the tractor to give complete compaction of widening strip in one pass in all granular materials used for flexible base-course widening. Compactor bases of 12" width and up may be substituted for the standard 26" bases to fit any widening requirement.

See YOUR JACKSON DISTRIBUTOR OR WRITE to us for details of this extremely versatile, multi-purpose, money-making equipment.

JACKSON VIBRATORS INC.
LUDINGTON MICHIGAN



A Caterpillar tractor with U-type dozer moves big chunks of rock to the crushing plant.
Ray Day Photo

(Continued from preceding page)

ondary unit. The primary unit consisted of a Cedarapids 30 x 48 jaw crusher, driven by a Caterpillar D8800 diesel engine. This crusher took all the feed from the U-type dozer and reduced the big chunks to minus 8-inch size. The material was then transported by belt conveyor to the secondary unit, a Pioneer Model 46-VE diesel-electric crushing and screening plant.

Raw feed entered this plant over a bottom sizing deck which screened out what little acceptable material was in the mix at this point. The remaining portion was then routed through the crushers of the 46-VE plant. These included a 10 x 36 jaw and a set of 40 x 22 rolls. Two sets of Symons vibrating screens were also used over the surge hoppers to separate ¾ to ⅜-inch and ⅜ to ⅜₁₆-inch rock. Finer material was deposited in a third bin.

In common with many native pit formations in arid western country, the material was deficient in the fine fraction passing the No. 80 screen. Acceptable pits not far from the asphalt plant setup yielded the needed fines in sizable quantities. A D4 Caterpillar tractor with a 1-yard Traxcavator shovel was brought in with dump trucks to haul this material to the hot plant. The design-mix showed 50 per cent crushed rock, 25 per cent pit sand, and 25 per cent blend sand. The net result was a perfect "down the middle" blend, close to the center of specification tolerances.

The remainder of the rock production schedule moved with precision and speed. Since it was practically a 100 per cent crushing assignment, the combination plant's production figures for the ¾-inch-minus product ran from 60 to 70 tons per hour. By starting well in advance of paving with the rock plant, the asphalt laydown operation was never held up because of lack of rock.

Asphalt Plant

The hot-mix production setup centered around a Standard 4,000-pound asphalt plant which had been converted to a 5,000-pound batch plant by Standard Steel Corp. Set up along the north edge of Edwards Air Force Base near Gate No. 1, the plant was a distance of 8 miles from the rock-production plant and about 6 miles from the center of the street work.

The Standard plant is a stock model, with the exception of the changeover to a 2½-ton batch. One important field alteration was made on this plant by George Bell, plant superintendent. Bell installed a 4-inch Roper asphalt pump on the end of the mixer shaft to inject oil more uniformly into the pugmill, to gain an advantage over the conventional gravity feed from the asphalt weigh hopper.

Jaeger offers new hi-performance 2″ pump

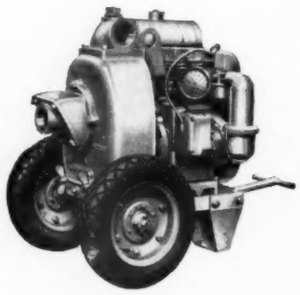
Pumps all the water a 2″ hose can handle. Operates at easy speeds. Weighs only 190 lbs.

Delivering its full rated capacity of 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm below the speeds of similar ordinary pumps) this Model 2PN actually pumps all the water that can be pulled through a 2″ suction line under average operating conditions. 28″ vacuum at the intake flange is not unusual.

Put this "Sure Prime" pump on your job and see how conservatively it has been rated, even at heads well above 100 ft. Equally remarkable, this performance is achieved by a pump that weighs only 190 lbs. on big, 13″ diameter pneumatic tires, only 160 lbs. on base, and measures only 24″ x 21″ x 26″ high, including tires.

Doubly-sure fast priming is guaranteed by Jaeger's combination of inherent self-priming and "jet" priming — two independent, simultaneous priming actions. Powerful Wisconsin AKN engine, delivering 5.3 hp at 2500 rpm, is ideally suited to this pump. This easy speed means longer life with high efficiency maintained by Jaeger's self-cleaning shell of 20% steel, long-life Lubri-Seal on pump shaft, reversible liner plate, and an impeller adjustable for wear.

For complete information on this model and other Jaeger pumps up to 10″ size, see your Jaeger distributor or send for Catalog P-10.



Only 190 Lbs. on Pneumatics

With capacity and pressure enough for good sized pumping jobs, this Model 2PN is yet light and small enough for a plumber's work. On cushion rubber tires weighs only 180 lbs., on base only 160 lbs.

THE JAEGER MACHINE COMPANY
701 Dublin Avenue, Columbus 16, Ohio
COMPRESSORS • TRACTOR LOADERS • TRUCK MIXERS • CONCRETE MIXERS • PAVING MACHINES

FOUNDATION CONSTRUCTION
CAISSONS
SHAFTS
DRILLED AND UNDERREAMED
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SPECIAL DRILLING PROBLEMS
Wire or phone for a quotation on your next foundation job — *ANYWHERE IN THE WORLD*
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The plant setup makes extensive use of diesel engines, although a Caterpillar D318 diesel-electric set was on hand for generating necessary electricity. A D17000 diesel engine was installed for the plant's main power, and there was even a D17000 on the dryer. This was more power than was necessary, but since the engines were available in one of the contractor's yards, they were brought in and set up. The dust-collector fans were driven by a Caterpillar D4600 engine.

Other important auxiliary equipment around the plant included a Cleaver-Brooks automatic steam generator. Fired with diesel fuel, it generated steam for the asphalt tank heating coils, the hot-pot insulation, asphalt-pump operation, and heavy-fuel atomization in the three burners of the dryer drum. A single Caterpillar D8 tractor and dozer took care of all 5 stockpiles of material entering the plant. The stockpiling arrangement was simple. Three sizes of crushed rock and one size of sand were stockpiled over a feeder tunnel which was tapped by controlled gates. One size of blending sand, stacked off to one side, was fed in at the cold elevator on a short conveyor.

Assisting in the final 3-bin classification of the mineral filler was a set of Symons 4 x 14 vibrating screens located over the plant weigh hoppers. To produce this particular mix, Bell used a 1-inch screen on the top deck, a ⅜-inch mesh on the second deck, and a special 4 x 5-mesh sand screen on the bottom.

The moisture content of the rock stockpiles was so negligible that laboratory men at the desert base were able to measure only moisture in the fine sand pile. The plant dryer simply boosted the rock temperature from about 105 degrees in the stockpile to 275-290 at the hot elevator. This was done so rapidly that good production runs were made. For example, 924 tons of material were sent out in one 5-hour run, and 1,838 tons went out in one 10-hour shift. The sustained 10-hour daily average through the entire paving job was at least 1,500 tons per day.

The 85-100 penetration asphalt cement was furnished by Douglas Oil Co. of California, from its refinery at Paramount. The bulk material was hauled about 105 miles at flow temperature by truck and trailer units belonging to the fleet of Airway Transportation Co. The trucking concern used 5 hauling units which ranged in total capacity from 20 to 24 tons per load. There was 75 tons of storage capacity available at the plant in three 6,000-gallon horizontal tanks, so that trucks and trailers kept the plant supplied by hauling 4 loads one day and 5 loads the next. Asphalt was unloaded into the storage tanks by gravity from the truck and trailer after they rolled up on a haul road built level with the top of the storage tanks.

Fast Laydown Work

The sizable plant output of hot-mix was handled in the field as fast as trucks could haul it out. The batch-truck contract, which at one time involved 14 trucks on the extreme haul, was subbed by Hess-Mace Co., Long Beach.

An unusual paving system was arranged with two Barber-Greene pavers. While one machine laid about 1,200 feet of material, the other moved back. On a 2-lane street, moving back was unnecessary; the machines simply alternated to lay the material. On 3 and 4-lane paving, the finishers used the move-back system.

Each finisher was staffed with its own operator, but the dumpman, screedman, and 2 rakers worked both machines. This gave trucks a place to put their asphaltic concrete at all times.

The initial breakdown roll was made by a 10-ton, 3-wheel Huber machine, which worked close to the laydown machine even on very hot days. This helped develop excellent densities. Project officials also believed that minor surface checking might be traced to this close-up rolling. This was eliminated to some extent by later rolling, and it disappeared entirely after being sealed by the first rubber-tired automobile traffic.

Secondary rolling was a job for a 10-ton Buffalo-Springfield tandem machine, and the third and finish roll was put down by a heavily ballasted 18-ton Buffalo-Springfield

Carries 18.0 cubic yards of earth cross-country at 35 mph with wheels on TIMKEN® bearings

THIS Wooldridge Manufacturing Company's Terra Cobra really has to take it to keep moving over rough ground with an 18.0 cubic yard load at speeds up to 35 mph. And Timken® tapered roller bearings in drive and scraper wheels help this Terra Cobra take rough ground in stride without breakdowns.

The tapered construction of Timken bearings enables them to take any combination of radial and thrust loads resulting from big loads and rough, uneven ground.

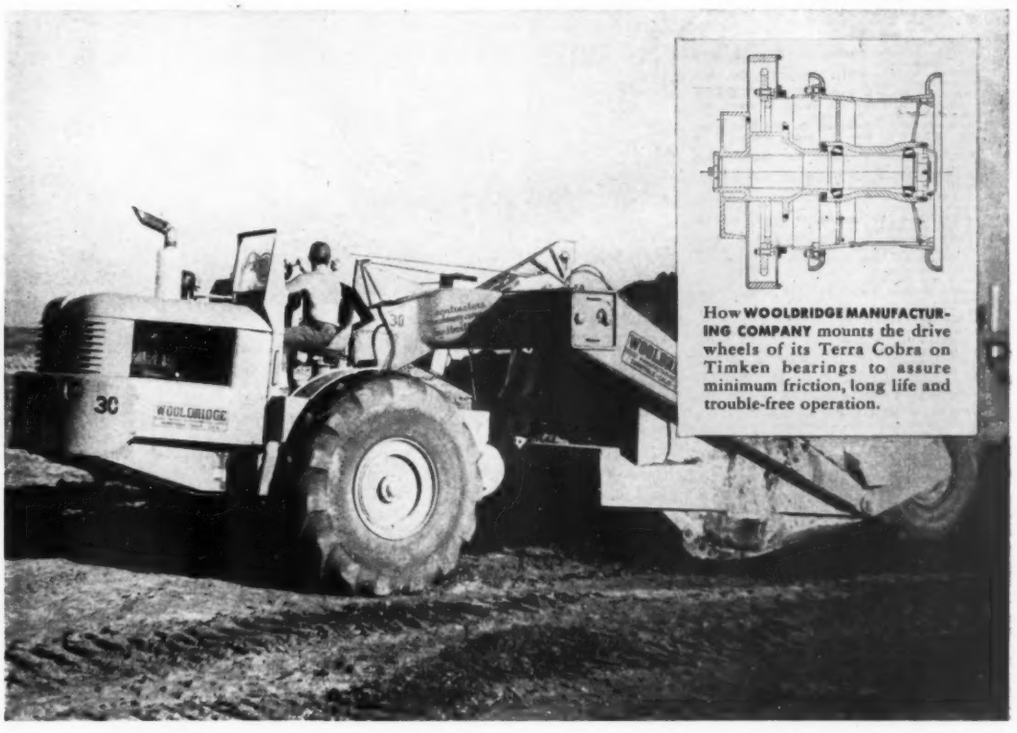
And Timken bearings provide extra load-carrying capacity because of line contact between their rollers and races.

Made of Timken fine alloy steel, the bearings are case hardened to give them a hard, wear-resistant surface over a tough, shock-resistant core.

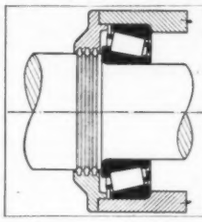
Bearing closures are more effective because Timken bearings hold housings and shafts concentric. Dust and mud can't get in—lubricant can't get out. As a result, maintenance is minimized, cost reduced.

Timken bearings can give *you* these same advantages. Always specify them in the equipment you build or buy. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **WOOLDRIDGE MANUFACTURING COMPANY** mounts the drive wheels of its Terra Cobra on Timken bearings to assure minimum friction, long life and trouble-free operation.



LUBRICANT STAYS IN —DIRT KEPT OUT

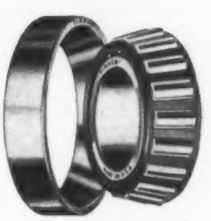
Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION ✳

Maximum Joint Filling

WITH

Servicised

SELF-EXPANDING

CORK

- **Recovers 50% Beyond Original Thickness After Compression**
- **Fully Compressible**
- **Non-extruding, Resilient**

Ideal for large concrete structures or masses where substantial initial contraction is anticipated before any considerable amount of expansion takes place. 50% expansion beyond original thickness after compression keeps joint space filled, regardless of concrete movement. Made in ½" to 1" thicknesses; 2" to 12" (Standard) widths; also made in 24" and 36" widths on special order.

Write for Catalog and Complete details on Servicised Joint Fillers and Sealers.

SERVICISED PRODUCTS CORP.

6051 W. 65TH ST. • CHICAGO 38, ILL.

3-wheel tandem roller. Two roller operators were able to handle all three machines, since the biggest machine did after-shift work.

Three weeks before the job was done, Jack Kasler gave orders for a thorough examination of all equipment, including hot plant, laydown machines, crushers, and rollers. Ten days before the job was finished, most of the parts needed were stocked in a field trailer. A few shifts' work at the end of the paving program will put good machines back in new condition. This type of equipment care was typical throughout the job.

Personnel

Project Manager Jack Kasler personally directed contract field operations. He was assisted by Frank Muren, superintendent, job 1; and Jim Stinson, superintendent, job 2; with George Bell as plant superintendent and J. D. Martin as street foreman.

Corps of Engineers activities were under the general supervision of District Engineer Col. A. H. Frye, Jr. W. J. Leen was chief of operations, and George P. Davis, project engineer. The Field Laboratory was under the general supervision of Earl Tharalson. THE END

Improved Pilot Bit For Post-Hole Augers

■ A new cone-shaped fishtail bit for use on all makes and sizes of post-hole augers has been announced by the Petersen Engineering Co., 460 Kifer Road, Santa Clara, Calif. It is claimed that the fishtail points of the Pengo Jr. cone pilot prevent pivoting when rock is encountered and that the narrow fishtails will not "walk" but will penetrate hard surfaces such as hardpan. The pilot bit has spiraled moldboards that screw their way into the earth, and their forward shape makes them self-sharpening.

The bit is held onto a drive lug by a small bolt. The drive lug is available in two types: the type that is threaded for screwing into the Danuser auger and the weld type that welds to any make of auger and is never replaced. When worn out, the pilot bit is dropped off either type of drive lug and replaced using the same bolt.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 66.

Pipe Fabricator

■ A machine that straightens or bends pipe up to 10 inches in diameter, Kelly joints, shafting, and steel sections is described in literature from the Alamo Iron Works, 120 Hoefgen St., San Antonio, Texas. The Alamo unit consists of a steel frame with a hydraulic pump and ram which one man can operate. The ram travels 15 to 20 inches per minute applying pressure up to 20 tons.

The machine is comparatively lightweight and may be moved from one location to another. The literature has detailed diagrams and instructions on how to use the machine. Complete specifications are given.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 107.

CLEAVER-BROOKS—DISTRIBUTORS

ALABAMA—J. D. Pittman Tractor Co., 500 N. 28th St., Birmingham 2; Burford-Toothaker Tractor Co., 2521 Halls Mill Rd., Mobile; P. O. Box 1591, Montgomery 2.
ARIZONA—Arizona Cedar Rapids Co., 1726 W. Jackson St., Phoenix.
ARKANSAS—Clark Equipment Co., Cantrell Rd. and Booker St., Little Rock.
CALIFORNIA—Casson Hale Corp., 22101 Meekland Ave., Hayward; Standard Steel Corp., 5001 Boyle Ave., Los Angeles 58.
COLORADO—H. W. Moore Equipment Co., 6th and Acoma Sts., Denver 1.
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D. C., WASHINGTON 2—Hovey-King Co., 314-316 Randolph Pl., N.E.
FLORIDA—Florida-Georgia Tractor Co.; Beaver and Huron Sts., Jacksonville; 3130 N. Miami Ave., Miami; P. O. Box 1511, Lakeland; Box 967, New Quincy Highway, Tallahassee; P. O. Box 2248, Tampa.
GEORGIA—W. C. Caye & Co., Inc., 787 Windsor St., S.W., Atlanta.
ILLINOIS—Hillman Equipment Co., Box 170, Bloomington; 2000 N. Hawthorne, Melrose Park; Wisner, Inc., 821 Main St., Peoria; 1319 Broadway, Rockford. 328 - 11th St., Rock Island.
IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 N. Fourth, Pocatello.
INDIANA—Reid-Holcomb Co., 1815 Kentucky Ave., Indianapolis.
IOWA—James W. Bell Co., Inc., 1720 1 Ave., N.E., Cedar Rapids; 2818 Fifth Ave., Des Moines 13.
KANSAS—The Victor L. Phillips Co., Box 1557, Wichita.
KENTUCKY—Bogle Equipment Co., 801 E. Third St., Lexington 47; 1212 S. Seventh St., Louisville.
LOUISIANA—Frank P. Fischer Engineering Co., 7924 Maple St., New Orleans 18.
MAINE—Parker-Danner Co., Riverside Drive, Augusta.
MASSACHUSETTS—Parker Danner Co., 25 Factory St., Hyde Park 36; 71 Needham St., Newton Highlands.
MICHIGAN—Eddy & Co., 2500 S. Pennsylvania Ave., Lansing 4; Straits Engineering Co., 400-2 Ashmun St., Sault Ste. Marie.
MINNESOTA—Ruffridge-Johnson Eq. Co., 250 Tenth Ave., S., Minneapolis.
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MISSOURI—The Victor L. Phillips Co., 10th and Baltimore Sts., Kansas City; The George F. Smith Co., 5215 Manchester Ave., St. Louis.
MONTANA—Hall-Perry Machinery Co., 304 Fratt Bldg., Billings; 802-812 E. Iron St., Butte; Coram; P. O. Box 507, Great Falls; Missoula.
NEBRASKA—Anderson Equipment Co., 200 Merchants Nat'l Bank Bldg., Omaha 2.
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NEW JERSEY—R. E. Brooks Co., Route 17, Box 17, Hasbrouck Heights.
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NEW YORK—Syracuse Supply Co., 76 Wall St., Binghamton; 2080 Military Rd., Buffalo 17; R. E. Brooks Co., 50 Church St., New York; Syracuse Supply Co., Portville Road, Olean; Van's Equipment Sales, Inc., Routes 9 and 20, Rensselaer; 1349 University Ave., Rochester; Syracuse Supply Co., 294 Ainsley Drive, Syracuse.
NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 5006, Asheville; P. O. Box 1205, Charlotte; P. O. Box 128, Guilford; P. O. Box 655, Wilmington; 3101 Hillsboro St., Raleigh.
NORTH DAKOTA—Northwestern Equipment, Inc., 715 11th St., Bismarck; 901 Eighth St., Devils Lake; P. O. Box 110, Dickinson; P. O. Box 152, Fargo; P. O. Box 335, Minot; P. O. Box 628, Wahpeton.
NEVADA—Sierra Machinery Co., 307 Morrill Ave., Reno.
OHIO—The W. W. Williams Co., 914 Main St., Cincinnati; 18301 Brookpark Rd., Cleveland 11; 835 W. Goodale Blvd., Columbus; 1260 Conant St., Maumee.
OKLAHOMA—The Victor L. Phillips Co., 1101 E. Archer, Tulsa; 1222-24 W. Main St., Oklahoma City.
OREGON—Howard-Cooper Corp., Highway 99E, P. O. Box 443, Albany; Highway 99, P. O. Box 88, Central Point; P. O. Box I, Coquille; First and Van Buren, Eugene; 5821 N. E. Gilsan St., Portland 13; 225 E. 2nd Ave., S., Roseburg.
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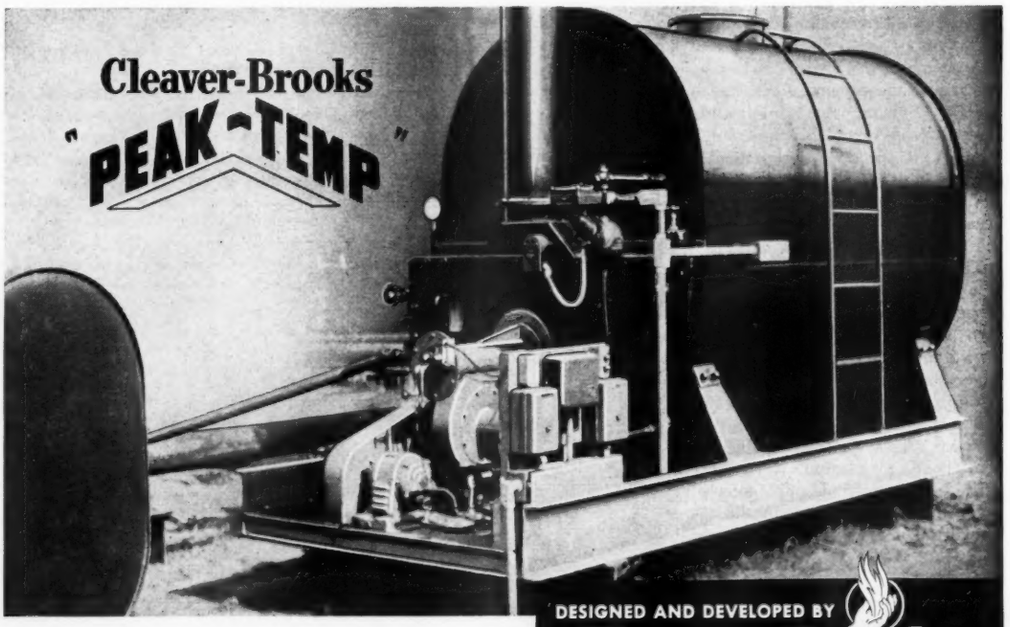
SOUTH CAROLINA—South Carolina Equipment Co., 444 Gadsden St., Columbia.
SOUTH DAKOTA—Sioux Road Equipment Co., 500 E. Sixth St., Sioux Falls; Box 941, Rapid City.
TENNESSEE—Wilson-Weesner-Wilkinson Co., 202 W. Morelia Ave., Knoxville; Tri-State Equipment Co., 124 E. Calhoun Ave., Memphis; Wilson-Weesner-Wilkinson Co., 310 S. 2nd St., Nashville.
TEXAS—Alamo Iron Works, Brownsville; Corpus Christi; Tri-State Equipment Co., 500 E. Overland St., El Paso; Conley-Lott-Nichols Machinery Co., 1311-19 S. Ervay St., Dallas 1; Conley-Lott-Nichols Company, 3601 Avenue M, Lubbock; Tri-State Equipment Co., P. O. Box 472, Odessa; Alamo Iron Works, Santa Clara & Montana Sts., San Antonio 6.
UTAH—Kimball Equipment Co., 222 W. 17th St., S., Salt Lake City 10.
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th St. and Killam Ave., Norfolk; Natural Asphalt Corp. of Virginia, 1901 Hamilton St., Richmond.
WASHINGTON—Glenn Carrington & Co., 91 Columbia St., Seattle 4; Howard-Cooper Corp., 5045-55 - 4th Ave., S., Seattle 8; Intermountain Equipment Co., 611 E. Sprague, Spokane.
WEST VIRGINIA—West Virginia Tractor & Eq. Co., P. O. Box 473, Charleston; P. O. Box 587, Clarksburg.
WISCONSIN—The Stone Manufacturing Co., 321 N. 25th St., Milwaukee 3; Badger Equipment Sales, Inc., Route 2, Thiensville.
WYOMING—Studer Tractor & Equipment Co., East Yellowstone Highway, Casper.
ALASKA—Glenn Carrington & Co., c/o Westward Hotel, Anchorage.
CANADA—Mussens Canada Ltd., Church St., New Brunswick, Fredericton; Coleman Machinery Co., Ltd., 101 Upper Water St., Nova Scotia, Halifax; Mussens Canada, Ltd., 65 Colborne St., Montreal 3; Ontario Equipment & Supply, Ltd., 111 Merton St., Toronto, Ontario; Frost Machinery Co., Ltd. 971 Erin St. Winnepeg, Manitoba; International Agencies & Machinery Co., 2315 Cambie St., Vancouver, B. C.; Mussens Canada, Ltd., Charest Blvd., Quebec.

NEW Oil Booster uses high-temp oil as heat transfer medium — eliminates water, steam and pressure problems



DESIGNED AND DEVELOPED BY
Cleaver-Brooks
Builders of Equipment for the Generation and Utilization of Heat — Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, "Deuce" and Bituminous Boosters

...gives you higher temperatures, faster, with lower fuel costs, less maintenance

"Peak-Temp" is the newest, quickest, lowest-cost way of heating oils, bituminous and heavy viscous materials in tank cars, storage tanks, bulk plants and refineries. By using a specially selected high temperature oil as the heat transfer medium, "Peak-Temp" gives you advantages never before possible in bitumin heating equipment. Look at this speed, economy and versatility!

HEATS TWICE AS FAST AS STEAM— "Peak-Temp" increases the temperature of bituminous materials at the rate of 25° to 30°F per hour. This is approximately twice as fast as with 150 lbs. of steam. Unit operates with oil at temperatures up to 600°F, without special pumps and fittings.

COSTS LESS TO OPERATE— "Peak-Temp" gives considerably more heat than steam unit using the same amount of fuel. What's more, "Peak-Temp" operates at atmospheric pressures, thus eliminating need for licensed engineer. Oil evaporation rate is very low. Users report 50 gallons or less of new oil need be added to system each season.

ELIMINATES WATER AND WEATHER PROBLEMS — "Peak-Temp" eliminates need for water tanks, water pipes, etc. Requires no special foundation. Heavy-duty base, plus self-contained readiness for fuel, electric hookup, simplifies installation. Heat transfer oil has pour point of approx. 5°F, and will not freeze under normal early spring and late fall operations.

"Peak-Temp" can make your bituminous materials handling a top efficiency operation — even on toughest heavy-duty jobs. Write direct for full information — ask for bulletin AD-108.

CLEAVER BROOKS COMPANY
Dept. C, 396 E. Keefe Avenue, Milwaukee 12, Wisconsin.

Quick Facts on "PEAK-TEMP"

- **FULLY AUTOMATIC.** Operates on the principal of a closed heating system. Quick starts. Quick shutdown.
- **OIL and/or GAS FIRED** — low-pressure, atomizing-type burner.
- **SAFETY CONTROLS** — protect circulating system against low oil level.
- **MAXIMUM HEAT TRANSFER**—Exclusive "Peak-Temp" feature: Colder oil returned from circulating system is baffled to maintain best heat transfer efficiency.
- **SELF-CONTAINED** — includes pump, valves, piping, temperature and low-level controls, electric motors and controls.
- **AVAILABLE IN TWO SIZES** of stationary, electric-driven units: Series 1200—and Series 1800.

The center of gravity on the new Willard truck mixers has been lowered and shifted forward.

Truck Mixers Designed For Greater Payload

■ New 5 and 6-cubic-yard truck mixers featuring improved weight distribution are announced by the Willard Concrete Machinery Sales Co., 11700 Wright Road, Lynwood, Calif. The center of gravity of the units has been moved forward and lowered by combining the pedestal and 90-gallon water tank. As a result, greater payloads are possible on any 10-wheel truck of 175-inch wheelbase or more, while the trucks remain within legal highway-load limits.

Power for the mixing drum is supplied by a side-mounted Chrysler six-cylinder industrial engine at the rear of the mixer. Equipped with fluid drive, this engine is said to offer exceptional operational control when used with the combination throttle and over-center drum brake which are standard on the Willard mixer. The mixer has a ratchet-controlled chute which measures 14 feet when it is extended.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 9.

Rubber Paving Compounds

■ The use of rubber road-paving compounds is described in literature from the Firestone Tire & Rubber Co., Akron 17, Ohio. Firestone Rub-R-Road paving compounds are available in powder or latex form in either natural or synthetic rubber and as powdered processed rubber. An advantage of the synthetics is that chemical and physical properties can be varied to meet a specific need.

The text explains that rubber added to the surface coat mix acts as a sealant which inhibits penetration of water or moisture with consequent elimination of breakup due to frost action. Besides making the surface coat tougher, it also keeps the mix flexible at a low temperature to improve wearing qualities.

Test strips described include mixtures in which rubber additives were incorporated with bituminous concrete, sand-asphalt, or sheet asphalt containing asphalt cement in hot mixes. The booklet gives typical installation data, test results, and a short history of the development of rubber road surfacing.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 92.

Mufflers for Trucks

■ Rust-proof mufflers for trucks are offered by McLeod Mfg. Co., 125 Verdugo Ave., Burbank, Calif. The McLeod Silencer is made for all models of trucks, gas or diesel powered. It is particularly recommended by the company for vehicles with automatic transmissions, including Hydra-Matic, Fluid Drive, Fordomatic, and Truck-O-Matic.

The baffles are placed in such a way as to keep the exhaust going forward at the same time that the backward pulsating action is slowed down. This motion is said to increase the breathing of the intake manifold, to improve acceleration, speed, and power.

The muffler is produced for individual truck models; the year, make, model, and type of transmission must be specified in ordering.

For further information write to the company, or use the Request Card at page 18. Circle No. 117.

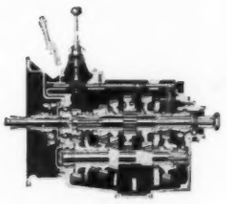
Metal-Stud Partitions

■ The use of factory-fabricated metal studs in the construction of non-load-bearing hollow partitions is described in a bulletin from the Metal Lath Manufacturers Assn., 636 Engineers Bldg., Cleveland 14, Ohio. Details are given on the size and spacing of the studs. Charts and tables describe fire and sound-insulation tests made.

Step-by-step photographs are used to show the erection of the partition.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 11.

bigger loads faster



Fuller 5-F-1220 Transmission

With payloads topping the 60-ton mark, modern material hauling is well-termed "the world's toughest trucking." That's why you'll find Fuller Transmissions—designed to *shift easy* and *deliver the torque*—in today's biggest off-highway trucks.

for example: This powerful Oshkosh Model W-2066-M Truck — shown loading up at the Jones & Laughlin open pit mine on the Mesabi—hauls 60-ton payloads up 10% grades. The constant mesh gears on its Fuller 5-F-1220 Transmission provide unusually **short, fast shifts**—and Fuller overlapped gears and relieved teeth ends **eliminate** gear stress concentration.

Fuller TRANSMISSIONS ®

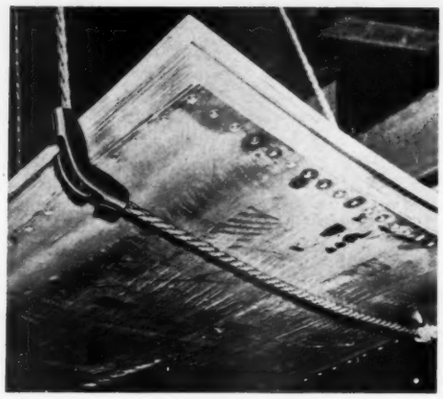
FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • Western District Branch (Sales & Service—Both Divisions), 641 E. 10th St., Oakland 6, Cal. • Shuler Axle Co., Louisville, Ky. (Subsidiary)

Device Protects Loads From Sling Damage

■ A new sling saddle or corner protector is being marketed by Newman Mfg. & Sales Co., Inc., Box 5939, Kansas City, Mo. The Newco sling saddle is cast in corrosion-resistant bronze. It can be attached to or removed from any wire rope or braided sling in a few seconds; yet the sling saddle fits tight enough on the rope or sling to prevent its sliding to the bottom when not in use. It can be moved or adjusted easily by hand for various-sized loads. The sling saddle is made in three sizes to handle from ⅜ through 1½-inch wire rope slings.

The saddle protects the body of the sling from being cut, crushed, kinked, or snarled in handling such building materials as steel or aluminum sheets and plates. With heavy packages of such metals, the bottom sheets are often damaged by the body of the sling. The sling saddle gives more bearing area, consequently eliminating rejected material.



The Newco sling saddle by Newman Mfg. & Sales Co.

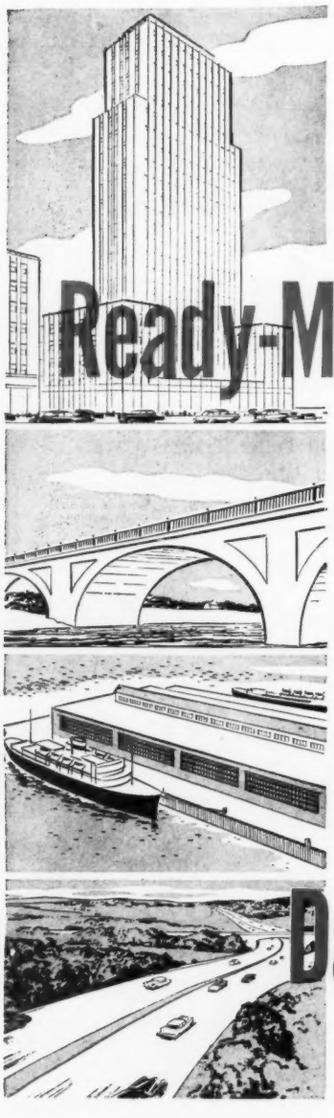
For further information write to the company, or use the Request Card at page 18. Circle No. 34.

Goodman Mfg. Acquires Diamond Iron Works Line

The line of crushing, screening, and handling equipment manufactured by the Diamond Iron Works, Minneapolis, Minn., has been acquired by the Goodman Mfg. Co., Chicago, Ill., maker of mining and tunneling machinery.

The manufacture of the equipment will be transferred to the main Goodman plant at 4834 S. Halsted St., Chicago, operating as the Diamond Iron Works, Division Goodman Mfg. Co.

Key Diamond personnel concerned with sales, engineering, and service will be retained under the direction of Carl E. Hanson, sales manager, and W. Eckley, chief engineer, who will make their headquarters in Chicago.



For any construction,

Ready-Mix Plants

can supply air-entrained

Concrete

made with

Darex AEA

DAREX AEA is the world's most widely used brand of air entraining agent. Not a by-product, it is specifically formulated to do just one job; help you get superior results. Concrete made with DAREX AEA will save you money because it places easier, finishes faster and better, has finer surface texture, is more durable.

Ask your nearby Ready-Mix plant for concrete made with DAREX AEA to insure the full benefits of air entrainment.

D A *Construction Specialties Division*

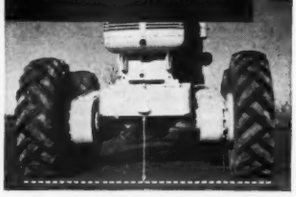
DEWEY and ALMY Chemical Company

Cambridge 40, Mass.

OFFICES OR SUBSIDIARIES IN Buenos Aires, Chicago, Copenhagen, London, Melbourne, Milan, Montevideo, Montreal, Naples, Paris, San Leandro (Calif.), São Paulo, Tokyo.

DARASEAL concrete curing compound • DARACONE masonry water repellent • DARALITE for lightweight aggregate

a WARCO® angle on "dead-heading"

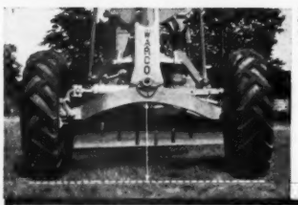


Yes, it's an angle you don't often see pictured . . . quite a change from the usual imposing front view. But with it, we can drive home a few points we'd like to make . . . and we'll back up our statements as effectively as we can back up our grader.

ONLY WITH A WARCO can back-up passes be accomplished so easily, so productively. When you're working in close quarters, with no turn-around space . . . don't "dead-head" back. In less than a minute, the WARCO blade can be swung 180° entirely by hydraulic control from the cab . . . and you're ready to make a productive back-up pass. In fact, *any* WARCO blade position can be secured hydraulically without the operator leaving the cab to make any manual adjustment of linkages.

ONLY WITH A WARCO can so much valuable working time be saved . . . through complete hydraulic control.

The WARCO tandem drive provides extra transmission height and working clearance under raised driving axle.



High arch of front end straddles a very high windrow . . . 30 full inches with 4D-100 and 29 inches with 4D-85 . . . no bulldozing with front axle.

W. A. RIDDELL Corp.

BUCYRUS, OHIO U. S. A.

Builders of WARCO Motor Graders and HERCULES Road Rollers

WARCO® MOTOR GRADERS : MODEL 4D-100 HEAVY DUTY 100 HP : MODEL 4D-85 MEDIUM DUTY 85 HP

Gilsulate, a new insulator, is poured around hot underground pipes.

Insulator Protects Hot Underground Pipes

■ A product for insulating and protecting hot underground pipes from corrosion is made by the American Gilsonite Co., 134 W. Broadway, Salt Lake City 1, Utah. Gilsulate is a blend of a sized and selected Gilsonite, a solidified petroleum. It is poured around the hot pipe to form an insulator. A layer forms as the material melts and is fused to the pipe. Outside of this first layer, a second zone of sintered Gilsulate particles is formed, and finally, there is a third zone of unconsolidated material. This triple zone of insulator is said to protect against such commonly encountered corrosive factors as alkaline ground waters, electrolysis, root attacks, and bacterial action.

The product is supplied in three grades for temperatures ranging from 220 to 520 degrees F. The three grades have a different initial melting point at which the plastic zone is formed.

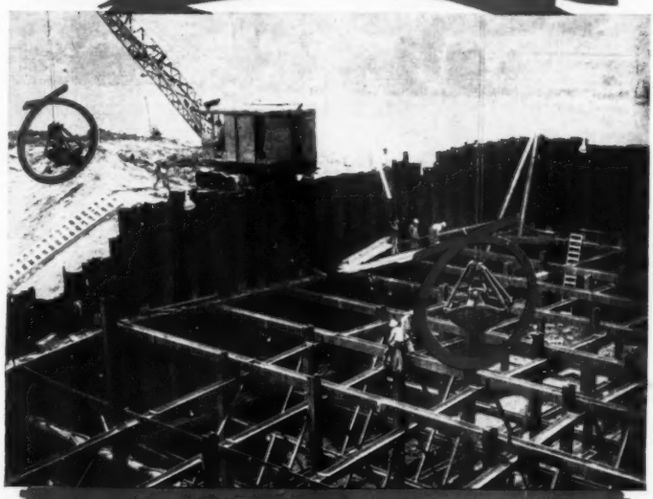
For further information write to the company, or use the Request Card at page 18. Circle No. 170.

L. B. Foster Appointments

George R. Forbes, Jr., has joined the New York sales staff of the L. B. Foster Co., Pittsburgh, Pa., a leading supplier of steel sheet piling, pipe, rails, and track accessories. He was formerly assistant general manager of the John R. Forbes Foundry & Iron Works.

Michael Darkoch has been named superintendent of warehousing for the Pittsburgh, Pa., district.

PLACEMENT CONTROL



AN OWEN FEATURE

The placing of a bucket in a narrow trench or caisson; or between closely spaced cribbing requires skill.

Whether it "lands" properly to assure efficient digging is largely a matter of correct bucket design.

Many an operator prefers Owen Buckets because they respond readily to his efforts — go where he wants them to go — and land in unseen places in an upright position ready to take a tremendous bite.

It's largely a matter of design — proportioning and balance, all of which are built into every Owen Bucket as a result of decades of "know-how" based on specialized experience.

AN ARMFUL AT EVERY GRAB

THE OWEN BUCKET CO.

6030 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

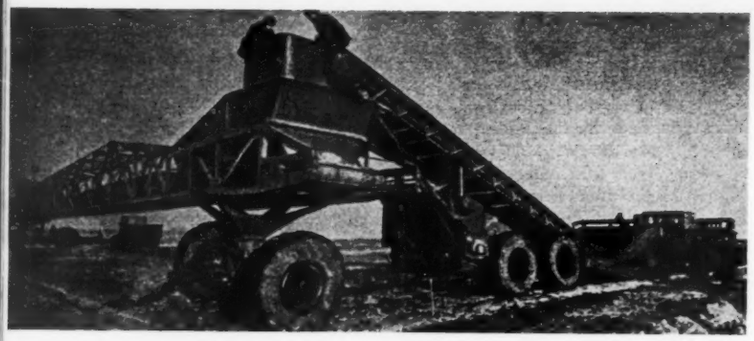
Who's Selling What . . . HERE?

LISTEN MEN . . . we almost mean it literally when we say: "We're not out to sell just Scaffolding to you." Frankly, we've got an idea to sell—an idea on 'how-to' erect better scaffolding—'how-to' *do the job cheaper!* The man we sold on this job, bought our idea of using 6½ ft.-high Ezebilt panels—cut 50 panels out of his needs and *saved almost one third in erection time* alone. THIS is what we're in business for—to provide you with not only the best scaffolding made, but also the best way to use it. Our new catalog pictures and tells many more reasons why you should buy Universal Ezebilt Scaffold.

Write for our New Informative Scaffolding Catalog

Distributors offer planning help and fast deliveries from Sales and Rental Stocks . . . See your phone directory

UNIVERSAL MANUFACTURING CORP., Zelienople 1, Pa.



The experimental D-264 scraper-excavator is towed by three tractors and has a 147-foot-long bridge conveyor to dump material far to one side of the steel plow.

Heavy Construction In the Soviet Union

Russians are trying to cut costs through mechanization of equipment, but they are not reaching their goals

THE SOVIET UNION is waging a vigorous campaign to bring its construction costs down. The major objective of the Russians' fifth Five Year Plan (1951 through 1955) is the lowering of building costs "not less than 20 per cent". Mechanization of equipment appears to be one of the primary means by which the U.S.S.R. hopes to achieve its goal.

While the pick and shovel and the rope-bucket hoist still predominate at thousands of smaller little-publicized jobs, bulldozers, excavators, scrapers, tractors, and dredges are appearing in growing numbers at the major high-priority projects. Most of this equipment is not yet in the mass production stage; hand-built experimental rigs are, for the most part, being used.

The D-264 scraper-excavator is one of the experimental machines being employed on the big hydro, canal, and dam projects, the so-called "great construction works of Communism". Designed primarily for digging navigation and irrigation canals up to 43 feet deep, the D-264 weighs 76 tons, rides on balloon tires, and is towed by three crawler tractors. It has a six-man crew and a rated earth-moving capacity of 1,962 to 2,354 cubic yards per hour. (The Russians use the metric system. For the sake of convenience, all these measurements have been translated into their U. S. equivalents and rounded off.)

Scraper is L-Shaped

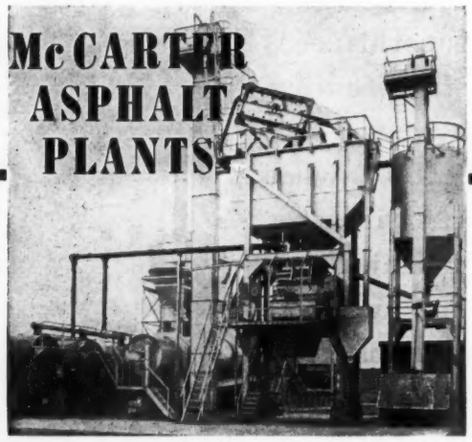
The rig is an L-shaped affair. Two tractors tow one leg, which is composed of a 10-foot-wide plow and an inclined conveyor. The other leg is a 147-foot-long bridge conveyor. The plow shaves off layers of earth up to 8 inches in thickness. The material moves up the first conveyor, transfers to the bridge conveyor, and is dumped far to one side of the plow. The unloading end of the bridge conveyor is towed by the third tractor.

According to the Russians, the D-264, despite its clumsy appearance, is highly maneuverable and can operate on a considerable slope. It is especially adapted for use on the flat treeless steppes of southern Russia. It is said to be able to do the work of six excavators of 4-cubic-yard capacity working with 100 dump trucks.

The EM-502 multibucket excavator, according to the Soviet press, is "an original machine of high efficiency, designed for "digging canals". The Russians claim the EM-502 "can, in a single day, scoop out a channel nearly two miles long, more than 8 feet deep, and more than 18 feet wide at the surface".

Walking Excavators

The 1,200-ton ESH-14/65 is a walking excavator said to have a



Truly Balanced Plants of 2000 to 6000-lb. Mixer Cap.

- McCarter . . . backed by 20 years' experience . . . designs and manufactures this equipment in their own works, assuring standardized parts and minimum costs.
- McCarter standard plants are readily adaptable to your special requirements. Individual units are also available.

DRYERS (Hot or hot and cold material, center outlet type)

MIXERS, ASPHALT BUCKETS (Steam, hot oil or electric heated)

AGGREGATE HOPPERS, BINS, APRON TYPE FEEDERS, CYCLONE COLLECTORS, ELEVATORS, STEEL STRUCTURES

REPAIRS AND MODERNIZING

We specialize in remodeling old plants for better production and more efficient operation.

CALL FOR ONE OF OUR ENGINEERS TO GO OVER YOUR PROBLEMS WITH YOU

Mc CARTER IRON WORKS, INC., Norristown, Pa.

BURLAP or COTTON

FULCO MATS CURE CONCRETE

quicker better cheaper!

Fulco Mats cure concrete in 72 hours, saving a week over the old 10-day, wet-burlap-wet-earth method.

They require less water for Fulco Mats hold moisture longer. Tests prove they minimize the possibility of concrete cracking; assure a more uniform job and give concrete greater compressive strength.

See your equipment dealer or write your nearest Fulton Branch for complete information about Burlap or Cotton, Concrete Curing Mats.

FULTON

also manufactures sturdy durable Triple Strength Tarps, Drop Cloths and Tents — indispensable protection at low cost.

SPECIFICATIONS:

Size: 5½' x 22'
Covers: Osnaburg or 7½ oz. burlap.
Filling: Cotton padding, 12 oz. per sq. yd.
Stitched: Sewed together, long way with stitches about 4" apart.
Flap: 6" flap of two layers of either burlap or osnaburg, along one 22' edge.
Weight: Osnaburg Mats about 24 lbs. each. Burlap Mats about 16 lbs. each.

Fulton BAG & COTTON MILLS

Atlanta • St. Louis • New Orleans • Dallas • Los Angeles • Denver • Minneapolis
Kansas City, Kans. • New York City • Phoenix • San Francisco • Winter Haven, Fla. • Savannah

This heavy-duty scraper, largest of its kind in Russia, has a 19½-cubic-yard capacity. Previous models of this type had capacities only as high as 15 cubic yards.

bucket capacity of 18 cubic yards, a 213-foot-long jib, and 48 electric motors. With a crew of from 5 to 16 men, it has a daily capacity of 15,700 to 18,300 cubic yards. An improved model, the ESH-14/75, has the same bucket capacity but is said to be more powerful, more efficient, and easier to maneuver. Its jib is 33 feet longer than the ESH-14/65.

Another walking excavator, the ESH-20/65, has the largest bucket capacity of any Russian excavator—27 cubic yards. With a 213-foot jib, it reportedly can move up to 19,600 cubic yards of rock or dirt in 24 hours.

The newest heavy-duty scraper of the Russians has a capacity of 19½ cubic yards. Said to be the largest in the U.S.S.R., it is designed for dirt-moving on road construction projects and is towed by a four-wheel truck tractor. Earlier earth-moving machines of this type had capacities only as high as 13 cubic yards.

The latest of Russia's suction dredges, the 1000-80, reportedly has a productivity of nearly 2,000 cubic yards per hour. The dredge is said to be able to excavate to depths of 82 feet below water level and has a 36-inch suction line. The MAZ-525, the Soviet Union's largest tip-up truck, has a capacity of 25 tons. It is 27¼ feet long and measures 10½ feet wide.

Mass Production Not Widespread

While Russia has demonstrated considerable ingenuity in developing these machines, mass production is still generally a thing of the future. Even comparatively simple rigs, such as tractors, often require several years between the introduction of advanced experimental models and quantity production.

Production of excavators in 1955 is scheduled to be 250 per cent of the 1950 quota. Scraper and bulldozer output next year was anticipated to be 300 to 400 per cent over 1950. Mobile cranes will roll off the assembly lines in quantities four to five times greater.

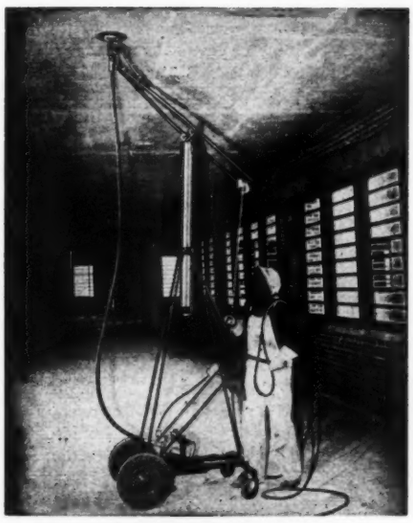
Despite these huge increases, however, the Russians do not appear to be reaching their goal. Evidence that the cost-cutting through mechanization drive is lagging behind expectations can be found in the daily press. Newspapers that devote their front pages to extravagant claims of new accomplishments are forced to admit, in their less conspicuous inside columns, that construction costs are not decreasing as hoped.

Costs Still High

The official Communist newspaper, *Pravda*, recently declared: "Construction costs have remained high. Builders often lag behind workers in industry with regard to decreasing

(Continued on next page)

RUBBING CEILINGS?



Do it with a GIRAFFE

For Ceilings Up To 12 Feet

- FASTER AND EASIER: One man will average almost 4000 sq. ft. per day. Does not need scaffolding.
- CHEAPER AND BETTER: Money saved on finishing will help pay for grinding.
- DEPENDABLE: Individual GIRAFFES have worked more than 1,000,000 square feet without major overhaul.

GIRAFFE®

CONCRETE GRINDING CORP.
300 STRAIGHT ST. PATERSON, N. J.

"For a bright future—all signs point to McKISSICK".

McKISSICK
CONSTRUCTION BLOCKS
Designed for Lower Operating Cost and Maximum Efficiency

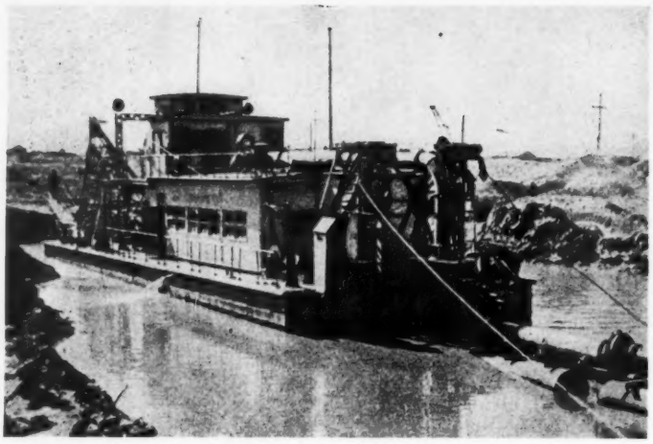
Alloy steel, flame hardened sheaves CUT wire line costs and sheave replacements.

Extra large center pins and and bearing assemblies MINIMIZE friction losses, pin and bearing replacements.

Extra weight and balance PREVENTS slow, wobbling falls.

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma



A Russian dredge at work on a hydroelectric plant. The U. S. S. R. claims to have a suction dredge that will excavate nearly 2,000 cubic yards per hour.

(Continued from preceding page)

production expense. There are many shortcomings in the organization of construction work.

"Mechanization opportunities are used unsatisfactorily, labor productivity is low, uneconomic use of materials is permitted, and overhead expenses are extremely great. As a result, construction costs have not been lowered at all on a number of construction projects."

In addition to the lack of adequate quantities of heavy construction equipment, other factors contributing to the condition are idleness of machinery due to breakdown, a shortage of spare parts, and poor job scheduling.

Still, Russia has been making great strides in heavy construction during the past few years. The 63-mile-long Volga-Don Shipping Canal was completed in 1952. The world's largest hydroelectric plant, Kuibyshev, spans the Volga about half way to the Caspian Sea and is rated at 2,000,000 kw. It will be completed next year. On the lower Volga, the Stalingrad hydroelectric plant will turn out 1,700,000 kw when completed during the next (sixth) Five Year Plan.

A 380-mile-long gravity-flow canal from the Volga to the Ural River has been started and will irrigate nearly 20,000,000 acres when completed, while the 683-mile-long Main Turkmen Canal from the Amu Darya River to the Caspian Sea, also under way, will bring water to millions of acres of barren desert land in central Asia. Three hydroelectric stations will derive power from this canal.

The Tsimlyanskaya Dam

The Tsimlyanskaya Dam and its power plant on the Don River was completed in 1952, and the Ust-Kamenogorsk Dam, with its power plant on Siberia's Irtysh River, was dedicated last summer. The Tsimlyanskaya Dam was completed, according to the Russians, in one year. It is said to be nearly 8 miles long and more than 130 feet high. It required 43,500,000 cubic yards of earthfill.

The Volga-Ural Canal, to be finished in 1957, will reach a maximum depth of 65 feet. When completed, its builders will have excavated 327,000,000 cubic yards of earth and have placed 91,560,000 cubic yards into the built-up banks. Finishing the canal banks and leveling the earth will involve another 130,800,000 cubic yards of earth-moving. The total volume of earthwork on the Volga-Ural project will exceed 523,200,000 cubic yards. Besides the main canal, which is 380 miles long, the Volga-Ural project will include 1,250 miles of irrigation channels. THE END

General view of project during paving operations. One section of new interchange crosses bridge (upper right) and proceeds along embankment in background.

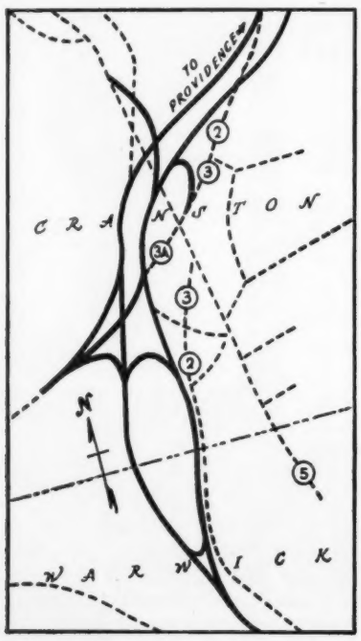
Jack Ramos (second from left), general superintendent for M. A. Gammino Construction Co., with (left to right) Sidney M. Budlong, Albert Capaldi and Carl Parker, state highway inspectors.

New Interchange Makes Things Easier for Bewildered Motorists

Until recently, the Cranston-Warwick area of Rhode Island, southwest of Providence, was no place for the timid motorist, or the bewildered stranger. For in that locality Routes 2, 3, 3A and 5 converged, the result often being a horn-tooting, temper-fraying bottleneck.

The aggravating condition has now been eliminated by the construction of the Meshanticut Interchange, a 1.48-mile double-barreled ribbon of concrete planned by the Rhode Island Dept. of Public Works, Division of Roads & Bridges. The newly opened highway, complete with sweeping turns, connecting lanes, bridges, culverts and service roads, keeps cars on the move, and cuts minutes from any trip through the area.

M. A. Gammino Construction Co., Providence, were the contractors for this important highway-improvement project. The engineers were Charles A. Maguire & Associates, also of Providence. Bethlehem furnished dowel units, fabricated steel and reinforcing bars.



Heavy lines show sweep of Meshanticut Interchange, in Cranston and Warwick, R. I. The new road eliminates congestion near where Routes 2, 3, 3A and 5 converge.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

PRODUCTS FOR HIGHWAYS INCLUDE

Dowel Units • Reinforcing Bars • Guard Rail
Guard Rail Posts • Spikes • Wire Rope and Strand
Hollow Drill Steel • Bolts and Nuts • Tie-Rods
Timber Bridge Hardware • Pipe • Sheet- and H-Piling

BETHLEHEM STEEL

Device Locks Braces To Steel Scaffold Frames

■ A bulletin on a self-locking device for use with its Trouble-Saver sectional steel scaffolds is illustrated in literature from Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y. Used to fasten the diagonal cross braces to scaffolding frames, the slide lock speeds up the erection and dismantling operations.

The SlideLok works by gravity action so that by simply raising it and then dropping it into the locked position, one or two braces are secured to the scaffold frame.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 40.

Truscon Names Engineer

Wayne R. Woolley has been named highway products engineer for the Truscon Steel Division of the Republic Steel Corp., Youngstown, Ohio, with headquarters at the home office. Mr. Woolley's background and experience in highway design and construction, coupled with Truscon's line of products, will make available to all highway engineers and contractors a complete service in connection with road-building projects.

Big Red TD 24 Power Play

Scores Against the Weatherman

An Actual Job Report from IH

CONTRACTOR PAUL CRAWLEY LANDS 800,000 CUBIC YARD CONTRACT ON NEW FLOODWALL FOR CAHOKIA CREEK DIVERSION CHANNEL ACROSS THE MISSISSIPPI RIVER FROM ST. LOUIS. BUT THE WEATHER DOESN'T WANT TO PLAY BALL...
I'M BEGINNING TO GET WEB FEET, PAUL, AFTER THREE WEEKS OF SPLASHING AROUND IN THIS RAIN!
THREE WEEKS OF IT! THREE WEEKS BEHIND SCHEDULE! WE'LL HAVE TO MOVE DIRT FASTER THAN WE EVER HAVE BEFORE.

APRIL RAINS FINALLY LET UP AND CRAWLEY GETS SET FOR A MUDDY KICK-OFF ON THE FIRST OF MAY...
I'M STAKING EVERYTHING ON YOU MEN MAKING UP LOST TIME! THERE'LL BE OVERTIME BONUSES FOR EVERYBODY! NOW LET'S GET ROLLING!

CONTRACTOR CRAWLEY AND MASTER MECHANIC RALPH DEVAULT COMPLETE THEIR PLANS...
EVERY MACHINE HAS TO WORK EVERY 10-HOUR SHIFT, RALPH! CAN YOU DO IT?
DON'T WORRY, CHIEF, THE OPERATORS ARE SHARING RESPONSIBILITY FOR THEIR RIGS WITH MY MECHANICS!
PAUL, I DON'T SEE HOW YOU CAN POSSIBLY MEET THE DEADLINE!
TAKE IT EASY, INSPECTOR! WE'RE JUST SHIFTING INTO HIGH GEAR!
THEN THE RAINS COME AGAIN...
PAUL, THESE FOUR TD-24'S ARE THE ONLY CRAWLERS ON THE JOB THAT CAN BRING LOADS UP THIS SLOPPY INCLINE!
YES--THAT'S BECAUSE THEY CAN CLIMB AND STEER WITH POWER ON BOTH TRACKS, BUT THE OTHER CRAWLERS CAN'T!
WE NEED A NEW INJECTOR, RALPH!
OKAY-- I'LL RADIO MARGE AT HEADQUARTERS AND GET PAUL TO FLY IN A NEW ONE!
HERE COMES YOUR PART, RALPH! HOPE I DIDN'T HOLD YOU UP!
WE'LL SLAP IT IN THE MINUTE YOU LAND, PAUL-- AND THAT BIG RED BABY WILL BE HITTING 100% AT STARTING TIME!
INTERNATIONAL

COPYRIGHT 1954, PICTORIAL MEDIA, INC.

CRAWLEY PUSHES RIGHT THROUGH THE WET SEASON, AVERAGES AS HIGH AS 14,600 CU. YDS. ONTO THE LEVEE PER 10 HOUR SHIFT.
WE'VE CHECKED AND RECHECKED OUR MEASUREMENTS, PAUL, AND YOUR DIRT MOVING FIGURES ARE ABSOLUTELY CORRECT! I DON'T SEE HOW YOU DO IT WITH SO FEW MACHINES!
HERE'S HOW, INSPECTOR! 27-YARD HEAPED LOADS... FAST LOADING TIME... AND TD-24'S THAT NEVER QUIT!
AND ON THE SIXTEENTH OF OCTOBER...
HERE'S THE WORD, MEN! WE'VE NOT ONLY CAUGHT UP -- WE'RE FINISHED EIGHT DAYS AHEAD OF SCHEDULE, THANKS TO YOU!
DON'T FORGET OUR TD-24'S, BOSS!
INTERNATIONAL
YEAH, MAN! YOU CAN'T BEAT FOUR "BIG RED" ACES!
YOUR CREW SURE DESERVES A HEAP OF CREDIT, RALPH! YOU HAVE KEPT DOWNTIME TO A MINIMUM ON THIS JOB.
AND THOSE BIG RED BABIES REALLY MOVE THE DIRT!
ENGINEEKS DOWN AT AREA HEADQUARTERS NICKNAMED YOU "LUCKY," PAUL!
IT TAKES MORE THAN LUCK, INSPECTOR! WHEN I GET A MAN-SIZED JOB, I GET MAN-SIZED CRAWLERS!

Meet the man they call "LUCKY"

Here's Paul Crawley, 32-year-old contractor from Edwardsville, Illinois and Clayton, Missouri. He currently (October, 1953) is working on five major levee contracts with the U. S. Army Corps of Engineers, totalling approximately 2,900,000 yards of dirt and $1,300,000.

Paul says, "Yes, I know they call me 'Lucky', but you need more than luck to make up nine weeks lost by rain and floods! We made up that time in a little more than three months. We did it with a team of top operators and mechanics who used the right equipment for the job we had to get done.

"My four TD-24 tractors showed their true worth when they kept right on working in the rain, climbing slippery levee slopes with heaping scraper loads . . . a job that caused our other tractors so much trouble we had to use them elsewhere. In one clocked 13-day period, we moved 197,700 cubic yards of dirt. TD-24 performance was a tremendous factor in helping us set this record."

By using the best in earthmoving equipment, by hedge-hopping in his two planes and by using a powerful FM radio with two-way phones in all his superintendents trucks, Paul not only kept this project rolling —he made the dirt fly on four other levee jobs at the same time!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

POWER TO MOVE THE EARTH

INTERNATIONAL

Meet the complete INTERNATIONAL line, the hardest-working work-teams in the world!

TD-24 crawler with matched scrapers

TD-18A crawler with matched scrapers

TD-24 crawler with bullgrader

TD-14A crawler with cable bullgrader

TD-9 crawler with hydraulic bulldozer

T-9 crawler with hydraulic bullgrader

TD-6 crawler with hydraulic bulldozer

T-6 crawler with hydraulic bullgrader

Model 2T-75 two-wheel, rubber-tired tractor with 18 heaped-yard capacity scraper

Model 2T-75 two-wheel, rubber-tired tractor with 20 heaped-yard capacity bottom dump wagon

Model 2T-55 two-wheel, rubber-tired tractor with 13 heaped-yard capacity scraper

Rivet Failure Reduced By Modern Techniques

The use of forges with temperature controls, the replacement of air hammers with presses, and the cold pressing of rivets all can help structural men in shops and in the field reduce the number of large rivet failures, according to the Townsend Co., New Brighton, Pa., a leading manufacturer of cold-headed fasteners and parts.

Looseness of large rivets has long been a headache of fabricators. Due to fractures in the rivets, these failures have often been blamed on the manufacturer, who has been accused of making rivets of poor quality. Actually, the blame should more properly be placed on overheating.

While more and more structural shops are recognizing the dangers of overheating, there is still a need for some educational work. Coal and coke forges have been replaced, to a great extent, with gas and oil heaters. But not every construction job has the benefit of temperature controls. Such controls can make sure the rivets are not heated too hot or too long.

The Townsend company recommends electric resistance rivet heaters, but warns that rivets placed in them must be free from what steel men call scale—a form of surface imperfection. Freedom from scale reduces the danger of arcing at contact points. Induction heating is growing in popularity. It is possible, says Townsend, that induction heating can be advantageously adapted to heating rivets for driving.

The use of presses instead of air hammers in shop assembly has several advantages. Most important is the fact that pressing has the effect of stoving the rivets throughout the length of the shank. Also, pressing permits lower driving temperatures.

Another trend is the cold pressing of large rivets. This method calls for the use of annealed, or normalized, rivets which are pressed cold with pressures of from 40 to 80 tons, depending on the diameter of the rivet. Here, too, the rivet stoves up throughout the entire length of the shank. Cold pressing considerably increases the shear and tensile values.

To contractors who do not have the latest equipment, the Townsend firm gives the following advice:

1. Make sure you are not overheating. A temperature of 1,900 degrees F, which makes the rivet look bright orange to the eye, should be the maximum heat applied when using air hammers. With presses, a temperature of 1,650 degrees F is sufficient.

2. Reduce scale by keeping the air mixture in the forge lean while avoiding long soaking in furnaces.

3. Keep fractured rivets to a minimum by doing some forging on the manufactured head as well as the driven head. To do this, the "bucking up" dolly should be slightly shallower than the height of the manufactured head and a little larger in diameter.

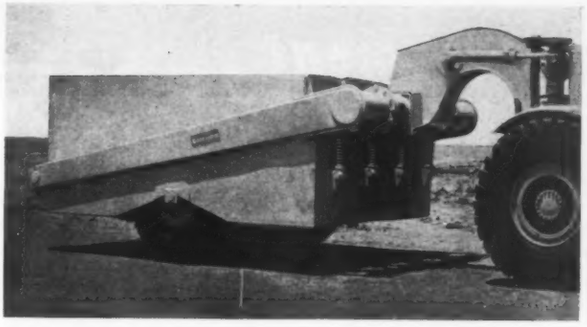
4. Investigate the possibilities of cold pressing annealed rivets.

5. Make rivet holes only a few thousandths of an inch larger than the nominal rivet diameter plus any allowance necessary for mis-alignment of holes in the parts to be joined.

New Hauling Yoke For Compaction Roller

■ A new flanged hauling yoke on the Southwest compaction roller changes the draft beam to match the DW21 Caterpillar and other standard wheel or track-type tractors, according to the Southwest Welding & Mfg. Co., 3201 W. Mission Road, Alhambra, Calif. The company manufactures compaction rollers ranging from 10 to 100 tons.

The unit has four weight boxes which may be filled with any material to obtain a single-tire load as high as 53,000 pounds. Each of the four weight boxes rides on its own wheel and tire. The boxes are hinged at the rear to oscillate independently up and down through a distance of 12 inches. This permits maximum compaction over the rough uneven surface of fills without bridging or shifting the compaction load.



The Southwest compactor roller features a new hauling yoke.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 121.

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Insuring American Contractors Abroad

By LEONARD H. COLLIER, Vice President, American International Underwriters Corp., New York, N. Y.

When World War II ended, American contractors expected a rush of overseas orders as an answer to the accumulated needs of war-restricted countries and as an aid to the task of rehabilitation. They did not reckon, however, that the overseas boom would last until the present. Surprisingly, even today's high cost of imported labor and materials scarcely has diminished the demand for the services of American contractors on overseas construction projects.

This continuing demand is by no means unaccountable. The Marshall Plan, Point 4, other forms of American aid, foreign military requirements, and the expansion of American private enterprise abroad have caused it. Less obvious, but far more significant as a factor, is the tecnical skill of U. S. builders, which has been recognized as a prerequisite to fast and adequate construction.

Moreover, American contractors have adapted themselves to the dwindling dollar budgets of foreign firms and governments; their services can often be afforded even without U. S. aid. Typical cost-slashing techniques are the use of local materials and the training and use of native labor with a minimum of costly U. S. supervision.

The American contractor who extends his operations to the foreign field should recognize the necessity for complete insurance coverage by strong American companies, payable in U. S. currency and serviced through his regular insurance agent or broker.

Deal With U. S. Carriers

There are several sound reasons for a contractor to deal with American rather than foreign insurance groups. In this way, one broker or agent can handle all of a contractor's needs. Furthermore, should a disagreement over a contract arise, the contractor will not have to deal with strangers who may be prejudiced by a national interest.

Some countries do not provide for as broad a coverage as is found in this country. Not all countries have

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metal forms for concrete construction

An insurance company executive explains why builders planning overseas jobs should deal with U. S. firms

Leonard H. Collier.

compensation laws, and some of those that do, do not cover all of an employer's liability to his employee. On the other hand, Venezuela has a compensation law which provides employees with benefits greater than those they would get in the U. S. For a contractor to meet his obligations toward native and U. S.-hired employees under local foreign laws, and to U. S.-hired employees under stateside statutes at the point-of-hire, the simplest, safest, and most economic plan for him to follow is to buy his insurance from an American company equipped to handle overseas claims.

In many cases, liability in foreign lands cannot be locally insured in dollars because of currency restrictions. Often damaged machinery that is insured can be replaced only in a dollar area. While foreign companies may run into difficulties, American insurance groups specializing in overseas insurance can always provide coverage in dollars.

Picking a U. S. Firm

Earlier, the phrase "an American company equipped to handle overseas claims" was mentioned. This means complete foreign facilities with a widespread network of overseas claims offices staffed by competent personnel versed in the laws, customs, and procedures of the particular nation as well as in U. S. laws. The prompt and skillful handling of claims on a local basis not only saves time and safeguards the public relations of an American contractor abroad, but also protects his loss record and ultimately lowers his insurance costs.

A major consideration when deciding with which American firm to deal is the restraints on a nonadmitted carrier as compared with an admitted carrier. Admitted coverage by an American insurance group means insurance issued in and with the permission of the government of the country in which the contractor is operating, and in conformance with its insurance laws. A nonadmitted carrier is forbidden to

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enter a company to handle a claim.

Of course, a claim may be handled under nonadmitted insurance. However, where salvage arrangements can be made—for example, in the case of a fidelity bond covering a dishonest employee—only an admitted carrier can go about making such recoveries. The absence of the possibility of salvage recoveries is reflected in higher premium rates of nonadmitted carriers. A contractor should make sure the firm he deals with is permitted to enter the country in which he is working.

In many countries, an American contractor has difficulty bringing a dishonest employee to justice because of local feeling. This, in itself, encourages dishonesty. An admitted insurer usually can move more freely than a contractor in seeing that punishment is meted out to the guilty persons.

Types of Coverage

Exactly what different types of coverage does an American contractor need when he is planning to handle a project abroad? Abroad, as at home, the contractor's first need is surety. This is a relatively simple matter. For an adequate surety bond, all a contractor need do is check the specifications to discover what he must furnish to qualify for the job in which he is interested.

Although most contractors are familiar with surety bonding, many of them are unaware of the need for fidelity bonding on construction jobs abroad. These bonds were originally written like surety bonds, guaranteeing an employee's obligation not to steal or embezzle. Then it was found they could be written, like insurance, on a statistical basis. They now insure employers against loss due to infidelity of employees and are written as insurance by many insurers.

The next consideration should be ocean-marine coverage. A contractor's equipment is usually regarded as a good risk by underwriters, and the rates are far from exorbitant. When getting this type of insurance, it is important to obtain an open cargo policy which automatically covers all shipments to and from the foreign job site. The coverage provides all necessary protection from the time the equipment and material leave their point of origin in the U. S. to the time they arrive at their destination.

Casualty and Fire

In setting up the casualty and fire insurance programs, the necessary coverage falls into three classifications: contractor's liability to his employees, liability to the public, and his own damage. Because some countries do not have compensation laws and employees' claims are adjudicated under the common law of the nation—which may vary from something similar to English common law to religious law such as the Shariah law of the Arab countries, based on the Koran—the cost is often unpredictable except through insurance.

The contractor's liability to members of the public concerns all coverages involving the responsibility of the contractor to third parties. The contractor's own damage concerns those coverages which indemnify him for damages to his own equipment and to equipment, materials, and structures in his care and for which he is responsible.

Because of the many imponderables in moving heavy equipment overseas, maintaining it on unfamiliar job sites in strange countries, and bringing it back to the U. S. or disposing of it abroad, it is wise to have the overseas inland-marine insurance with the same underwriters who carry the ocean-marine risk. In the event of borderline claims, the contractor is spared being in the middle of a dispute between two underwriters, each loathe to pay a loss which might—after lengthy investigation or court action—prove to be the other's.

It is possible to buy both ocean-marine and overseas inland-marine insurance from the same U. S. organization. The same wisdom applies in arranging builder's risk insurance with the same firm writing the ocean coverage.

Builders Risk Insurance

Builder's risk insurance usually attaches from the moment the in-

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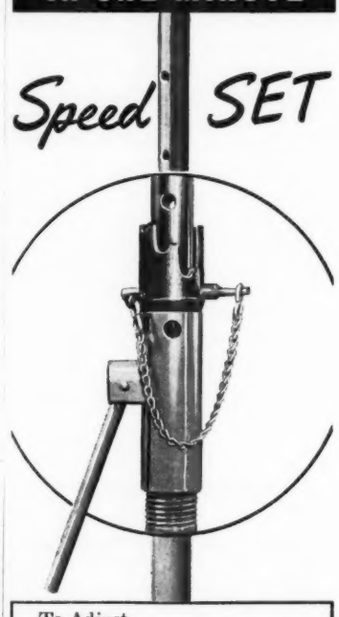

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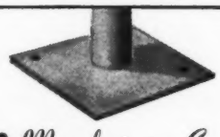

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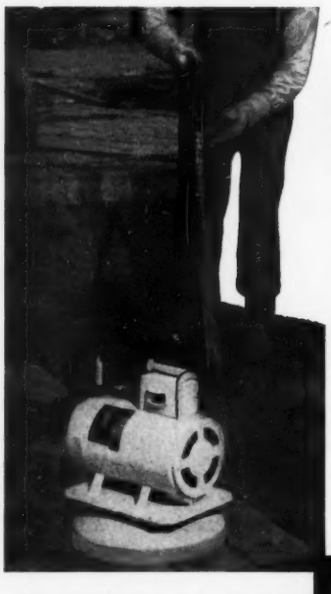

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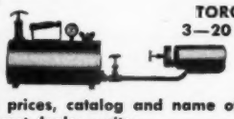

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sured property becomes a risk of the insured—after cessation of marine coverages—and is in force continually while at the job site awaiting and during installation. It continues until the completed work has been tested and accepted by the owner.

Sometimes, in order to secure a certain type of employee, it is necessary for a contractor to provide more than the straight compensation insurance. Many employers, either from necessity or with a view toward better labor relations, purchase accident insurance for key personnel. Payrolls, too, should be insured against the usual burglary, hold-up, and miscellaneous perils.

Another point to remember: underwriters cannot quote their lowest possible rates on flimsy information; they must have a complete engineering survey of the job site. The more complete the information, the better the insurance and the lower its cost. Finally, the necessity of consulting with competent insurance counsel well in advance of the signing of any contracts should be emphasized. THE END

Windrow Loader Described

■ A catalog on its windrow and stockpile loader is now available from the Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill. The booklet shows the Athey Force-Feed HiLoader on a variety of applications and details its features. Actual job data is presented.

The loader has a full-floating feeder suspended from two coil springs and a pivot which allows the paddle blades to float over the contour of the windrow. An auger gather-feeder speeds up loading. Its spiral blades extend to the moldboards of the gather and keep a steady flow of material feeding inward to the padded blades.

A 30-inch cleated conveyor belt handles snow, sand, and other light materials as well as heavier earth and rock. Capacity is listed as 10 cubic yards per minute for free-flowing materials and 25 cubic yards per minute for snow.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 75.

Crane Weight Indicator

■ A weight-measuring device which can be attached to boom or bridge cranes or overhead hoists having capacities of up to 50,000 pounds is made by the Martin-Decker Corp., Long Beach, Calif.

The Type S-6 crane weight indicator consists of a small hydraulic-pressure transformer installed at the dead end of the hoisting cable and a high-pressure hydraulic hose to transmit the weight impulse to a small indicating gage. The indicating gage, with a 6-inch direct reading dial, is mounted at the operator's position for convenient tare adjustment and accurate readability.

The guaranteed accuracy is one per cent of the maximum reading on the dial, but the manufacturer reports that the instrument is calibrated and tested at the factory to an accuracy of plus or minus ½ of one per cent. This accuracy is unaffected by temperature changes or small variations in the amount of fluid in the system.

The crane weight indicator is available in 10,000 to 50,000-pound capacities. Installation is easily accomplished with little or no change in equipment.

For further information write to the company, or use the Request Card at page 18. Circle No. 53.

New Staedtler Location

The American headquarters of J. S. Staedtler, importer of Mars pencils, used by engineers, architects, and draftsmen, has been moved from Worth St., New York City, to 25 Dicarolis Court, Hackensack, N. J. The organization's new building, with its larger facilities, will augment the company's storage space.

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Aurora, Illinois, U. S. A.

The new Pettibone Speed Swing loader can turn its bucket in a wide arc.

New Loader Bucket Swings 180 Degrees

■ A 180-degree boom swing permitting discharge of the load to the left, right, or front without moving the loader out of the digging position line, is a feature of the new Pettibone Speed Swing loader. It is reported that this feature cuts loading time, particularly when the work is in tight spots, since it is not necessary to maneuver back and forth as with the standard front-end loader.

The unit is available with two or four-wheel drive, optional four-wheel steer, ¾ or 1-cubic-yard bucket, and with several accessory attachments. These include a fork, crane hook, backfiller blade, and 4-cubic-yard snow bucket.

Another feature is a 30-degree bucket tilt up providing shovel action. The loader also has a torque-converter transmission system which delivers uniform power at maximum efficiency and inch-by-inch crowding without shifting gears.

Specifications are: a 15-foot discharge height over the fully raised bucket, a 3¼-foot reach from the front tires at a 10-foot dumping height and a 5⅓-foot reach at a 7-foot dumping height, forward-reversing lever, hydraulic steering, hydraulic brakes, and full hydraulic control. Bucket down pressure, bucket float control, replaceable bucket lip, big flotation tires on all four wheels, ball-bearing turntable, heavy-duty axles, and operator visibility are other design advantages built into the machine.

For further information write to the Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 7.

Blaw-Knox Acquires Apsco

Negotiations have been completed for the acquisition of the All Purpose Spreader Co., Elyria, Ohio, by the Blaw-Knox Co., Pittsburgh, Pa. Included in the purchase is Apsco's established line of highway construction equipment.

With the acquisition of the Apsco line, Blaw-Knox now can furnish equipment not only for paving high-type state highways and turnpikes with either concrete or asphalt, but also for all types of highway construction and improvement, including road widening and the placing of stone base.

The purchased firm's road widener has been added to the Blaw-Knox line under the trade name Blaw-Knox-Apsco Widener. Its base paver has been added under the trade name Blaw-Knox Base Paver. Other products acquired in the transaction will be on the market in the near future.

Portable Gravel Plant Crushes, Screens, Loads

■ A portable two-stage gravel crushing, screening, and loading plant designed to meet state weight limitations is described in literature from the Universal Engineering Corp., 620 C. Ave., N. W., Cedar Rapids, Iowa. Photographs illustrate the basic working components of the Model 880 Senior R Gravelmaster and the flow of material with the plant.

Pit material is uniformly fed by the plate feeder onto the 30-inch-wide feed conveyor, which takes it up to a 4 x 12-foot 2½-deck screen. The material retained on the top scalping deck flows to a 1036 primary jaw crusher. Material passing the top deck and retained on the second deck flows to a 30 x 24 roll crusher. Material that has gone through to the bottom half-deck sand screen flows to the mixing hopper. A swinging gate permits the desired amount of fines to be blended with the finished product or the rejection of sand with the optional sand reject conveyor. The finished material is discharged through a front delivery conveyor. The plant has a rated capacity of 275 tons per hour of 1-inch-minus 25 per cent crush material.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 97.

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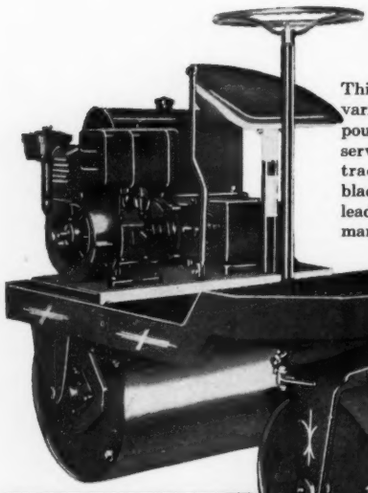

This all steel tandem roller has a variable weight of from 1100 to 2300 pounds. It is built for heavy duty service on athletic fields, running tracks, tennis courts, lawns and blacktop paving. It is used by many leading universities and cities, plus many other institutions. For tops in design, engineering and performance, you can't beat the Rollpac.

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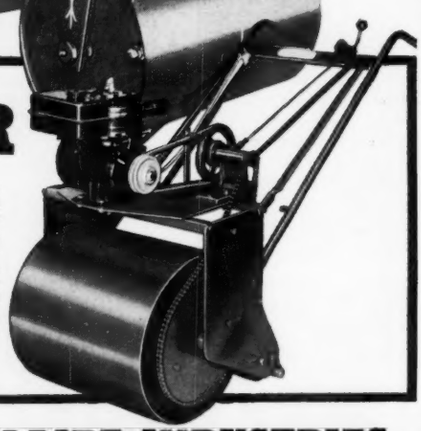

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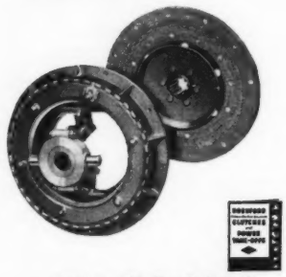

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ROCKFORD CLUTCH DIVISION BORG-WARNER

314 Catherine Street, Rockford, Illinois, U.S.A.

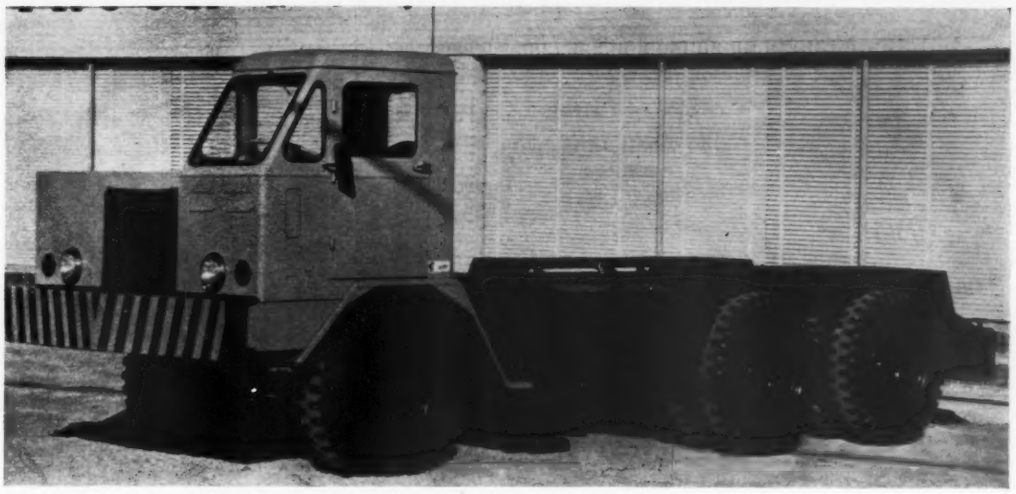
New Crane Carriers Feature Heavy Frames And Six-Wheel Drive

■ Three new crane carriers have been announced by the Crane Carrier Corp., P. O. Box 5008, Tulsa, Okla. In addition to its Model 500 for 6 to 10-ton cranes, introduced last summer, the line now includes the Model 600 designed for 12½-ton cranes, the Model 700 for 15 to 17½-ton units, and the Model 750, rated at 20 tons. A 25-ton carrier is scheduled for production in the near future.

The chief feature of these carriers is that their heavy frames are of all-welded construction and made of 12-inch-wide-flange H-beams. The frames are also reported to be extra wide, allowing all cranes to be mounted more easily, and are guaranteed for the life of the machine.

Six-wheel drive is an added feature of the line. It is standard equipment on the Models 500 and 600 and is optional on the Models 700 and 750. Some additional optional features are front and rear outriggers, rear fenders, and size of tires.

Specifications for the Model 600, a 12½-ton-capacity carrier, list an International BD282 130-hp engine; a five-speed Fuller 5A33 transmission and a two-speed auxiliary transmission allowing ten speeds forward and two reverse; and 9:00 x 20 tires (with 10:00 x 20 tires available optionally). A Hercules JXD engine is also optional.



This new unit made by the Crane Carrier Corp., the Model 700, features a heavy all-welded frame.

The Model 700 has a Ford V-8 155-hp engine. It has 6 x 4 drive and runs on 10:00 x 20 tires, although it is possible to get 11:00 x 20 tires. A Clark main transmission with five speeds forward and one reverse, and a Fuller PD 45 auxiliary transmission are standard equipment. Over-all width of the unit, which has a wheelbase of 150 inches, is 96 inches. The weight of the chassis, including the outriggers, is 18,000 pounds.

Model 750 is powered by a Ford V-8 155-hp engine, with optional engines by Hercules or Waukesha. The main transmission is a Clark unit with five speeds forward and one reverse, direct in fifth. The auxiliary transmission is a Timken T-77 or Fuller 2A92, which, in combination with the main transmission, gives ten speeds forward and two reverse. The service brakes are Bendix-Westinghouse air brakes on the front and rear axles. Standard equipment for this carrier is the same as in the Model 700. The chassis weighs 20,150 pounds, outriggers included.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 120.

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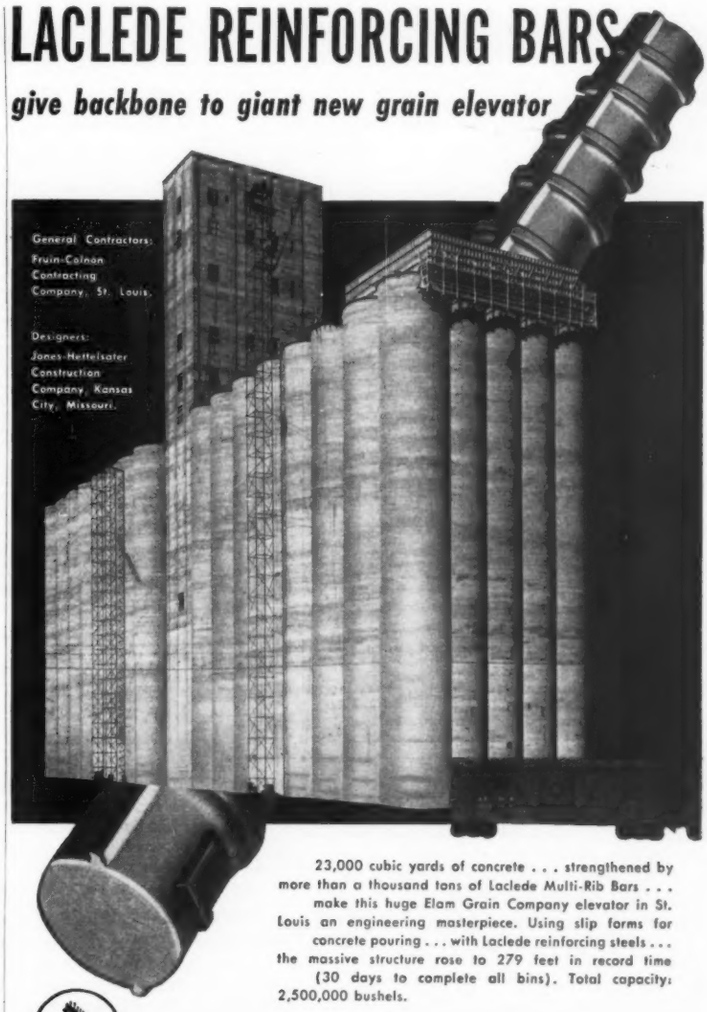

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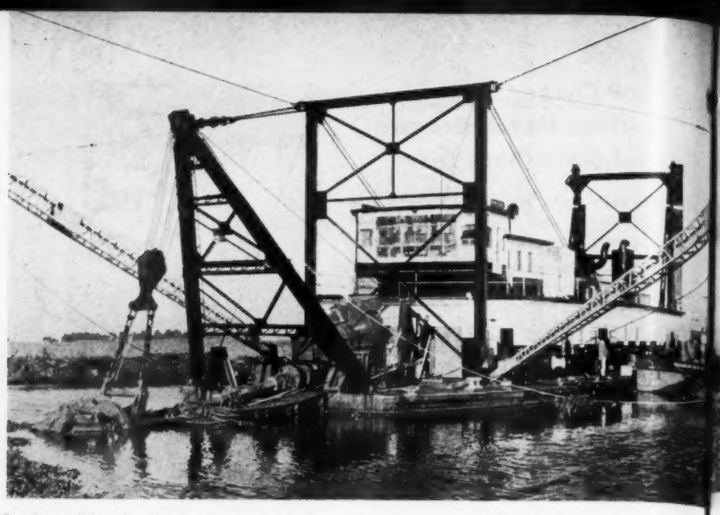
Construction Camera

Initial Paving—A Blaw-Knox 34-E paver, followed by a B-K spreader and a dual-screed finisher, works at the eastern end of the Ohio Turnpike. Harrison Construction Co., Pittsburgh, Pa., contractor on this first paving section, will finish its 5-mile job on the midwest superhighway early this year.



Dredging Job—Overburden is removed from a borrow pit in the Florida Everglades by the 24-inch dredge Fairlee, owned by Gahagan Construction Corp., of New York City. Later the blasted lime rock beneath will be dredged out and built up into a flood-control levee.

Ohio Turnpike News

After interruptions caused by several legal snags, 237 miles of the 241-mile route of the Ohio Turnpike Project No. 1 across northern Ohio is under construction or has been authorized for construction, James W. Shocknessy, chairman of the commission, announced. Total cost of contracts awarded is $211,894,154, only 2.14 per cent more than the estimates made in 1951.

The only section not under contract is a 4-mile strip on the northern perimeter of Elyria, Ohio. Legal problems affecting the award of this contract are now before the courts. Pavement has been laid at the easternmost end of the turnpike where the first concrete was poured October 28, 1953.

Early last year, a legal snarl delayed the awarding of contracts until June, losing virtually an entire construction season. Another legal dispute was not settled until the beginning of October.

An opening date of December 1, 1954, has been named for the 21.4-mile stretch of the turnpike between the Pennsylvania line and State Route 18 west of Youngstown, Ohio. Target date for opening the remainder of the turnpike to traffic is October 1, 1955.

Safety Pamphlet Is Issued

"Current Safety Topics in the Construction Industry", Volume 8 in the National Safety Council's series of pamphlets, is concerned with the ideas and experiences of some of the nation's top safety men as they were presented at the construction session of the 41st National Safety Congress. Among the topics covered by the booklet are an analysis and explanation of National Safety Council construction safety materials; the application of engineering principles to safety; and safety practices in building, highway, and heavy construction. Other subjects are the insurance company's part in keeping the contractor competitive and job placement physical examinations.

Copies of the pamphlet may be obtained from the council, 425 N. Michigan Ave., Chicago 11, Ill. The cost of the booklet for members is 35 cents, and for nonmembers, 70 cents. Discounts are allowed on bulk orders.

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These rugged new Chevrolet trucks have extra strength in chassis and drive line for longer, lower-cost life. For example, there are higher-capacity clutches, stronger rear axles and more rigid frames in all heavy-duty models.

Drop by your Chevrolet dealer's soon and see the huskiest, "savingest" trucks in Chevrolet history! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

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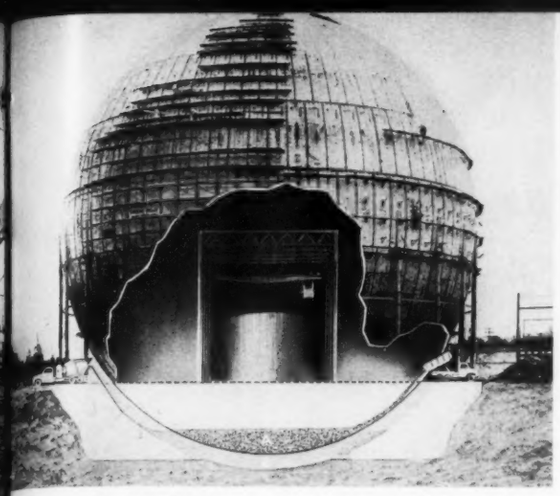
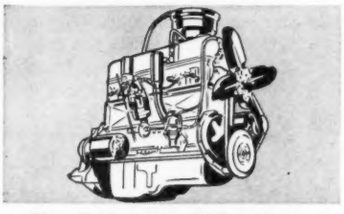


Limestone Mat—This cross section of the Atomic Energy Commission's steel testing sphere shows how Rust Engineering Co., Pittsburgh, Pa., placed 28,000 tons of crushed limestone inside and a 3,900-cubic-yard layer of concrete outside the structure.

Balancing Act—Pulling a sheepsfoot roller onto a Phelan Low-Boy with a Tulsa winch is a routine maneuver for Marion Construction Co., Ocala, Fla. This mode of equipment transportation was used by the contractor when preparing a roadbed for two extra lanes on U. S. 1, south of Waycross, Ga. The additional lanes will make the route into a sorely needed four-lane road.



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*Optional at extra cost. Ride Control Seat is available on all cab models, "Jobmaster 261" engine and two-speed rear axles on 2-ton models.

Public Building Up In New York State

Publicly-financed construction in New York State is going forward at an annual rate of nearly $900,000,000 and is expected to continue at a high level throughout 1954, according to an analysis by the New York State Department of Commerce, based on a special report prepared for the department by the F. W. Dodge Corp.

The report covers the 12 months between September, 1952, and August, 1953, and includes contract awards of $400,000 or more. These large contracts amounted to almost $790,000,000. The department estimates that the awards included in the report constitute about 90 per cent of all public contracts, That would put the complete total at about $875,000,000.

The volume of public construction contracts during the period covered by the survey was substantially greater than the volume let in any previous post-war year.

Contracts for streets, highways, and bridges constitute 43 per cent of the total, $399,000,000. Awards for highway construction were unusually large during this period due to the letting of many large contracts for various sections of the New York State Thruway.

HRB Publications

The latest issue of "Highway Research Abstracts", containing synopses of many of the papers and reports presented before the 33rd annual meeting of the Highway Research Board in January, is now available. It contains summaries of papers and reports on economics, finance, and administration; design; materials and construction; maintenance; traffic and operations; soils; and night visibility.

Also available is Special Report 15, "Highway Research Organizations", a description of existing organizational patterns and their scopes of activity. In addition to discussing the several different kinds of research, the booklet contains an appendix with 18 pages of suggested forms and contracts for setting up research projects.

Both "Abstracts" and Special Report 15 may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Construction Camera

Showing Off—The first Sierra Loader to be shipped overseas is demonstrated on a highway project being constructed on the outskirts of Paris. Pulled by a Caterpillar tractor, the loader empties into a Cat No. 20 scraper, which in turn is pulled by a Cat DW20.

Big Digger—In the bituminous coal fields of southeastern Ohio, this Marion 5561 all-electric stripping shovel with a 45-cubic-yard bucket sets a high mark for earth excavation. The machine, powered and controlled by General Electric equipment, removed 1,622,883 cubic yards of overburden in a month.

compare for operator safety with any other tractor loader!

Note that the operator on a BAKER-LULL SHOVELOADER sits high and safely remote from moving bucket arms, which are located in front of him. This eliminates the constant hazard to life and limb of flailing control arms beside and above him, as in other makes.

Note, too, that operator has unobstructed 360° visibility to see where he's going at all times. There are no blind spots at sides caused by control arms as bucket is raised. From the driver's seat he has full view of the bucket in every position—even when digging.

Safer operation is also assured by 4-wheel hydraulic power brakes, hydraulic power steer on front or rear or all four wheels, big 14.00 x 20 hi-flotation tires, 100-inch wheelbase for stability, etc., etc.

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South Carolina Road Construction Report

The South Carolina Highway Department estimates that contract awards for the current year will equal, or slightly exceed, those of 1953, with the total approximating $25,000,000. As in recent years, much of the expenditure will go to secondary-road construction.

The department has programmed about 800 miles of resurfacing in 1954 and expects to extend the yellow barrier lines to 2,500 additional miles of primary routes. At the end of 1953, there were 23,665 miles of primary and secondary roads in the highway system of the state.

Construction awards for road building in 1953 totaled $24,640,279. Of this, $8,431,482 represented work on the primary system, and $16,208,797 went for secondary-system construction. Last year's program brought the state an additional 60.4 miles of primary roads, costing $3,510,882; and 1,419 miles of secondary roads, costing $15,580,837. In bridge construction, 23,594 feet of structures were built at a cost of $5,548,560.

La. Chief Engineer Dies

John Alexander McNiven, chief engineer for the Board of Commissioners of the Port of New Orleans, La., for the past 24 years, died recently, at the age of 67. He joined the board as assistant engineer in 1917, a year after emigrating from Canada.

A self-taught man, Mr. McNiven designed and supervised the work on the port's original grain elevator and launched a $30,000,000 port-expansion program. He was president of the Louisiana section of the ASCE.

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Integrated Plant—Nearing completion is the 1,700-acre La Quinta Alumina plant of Reynolds Reduction Co. on the north shore of Corpus Christi Bay, Texas. Included in the new facility, a completely integrated bauxite-to-aluminum operation, is a pier where ore is unloaded by conveyor and taken to storage piles.

Mountain Dam—Up in California's High Sierras, a Southwest compaction roller is pulled by a Caterpillar DW21 tractor as it works on the Vermillion Valley Dam project. Work on this project is being done under the supervision of the Southern California Edison Co. of Los Angeles, Calif.

Work Begins on Extension Of Pennsylvania Turnpike

This month, construction will begin on the Pennsylvania Turnpike's northeastern extension, which will eventually run to the New York state line. The first 100-mile section will extend from the Delaware River extension—now under construction—through the Allentown-Bethlehem metropolitan area, the anthracite coal regions, and the resort sections of the Pocono Mountains.

The proposed extension, the first north-south leg of the superhighway, will start near the Delaware River extension in Montgomery County, and swing northwesterly, continuing in that general direction to the state line.

Together with the 33-mile Delaware River extension, scheduled for completion in October, the new project will provide the state with a superhighway system more than 460 miles long. The northeastern extension is expected to serve as an inducement to the location of heavy industry in the area since it will provide a ready access to port facilities and other industries.

Kuljian Names Architect

Martin W. Chandler has been appointed head of the architectural department of The Kuljian Corp., a Philadelphia, Pa., engineering and contracting firm. Mr. Chandler joined the company in 1945 and has worked on many Kuljian projects since then, including the Florida Power Corp.'s Higgins plant in Booth Point, Fla.; the Bokaro thermal power plant in India; and the Palermo steam power plant in Palermo, Sicily.

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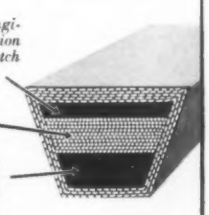

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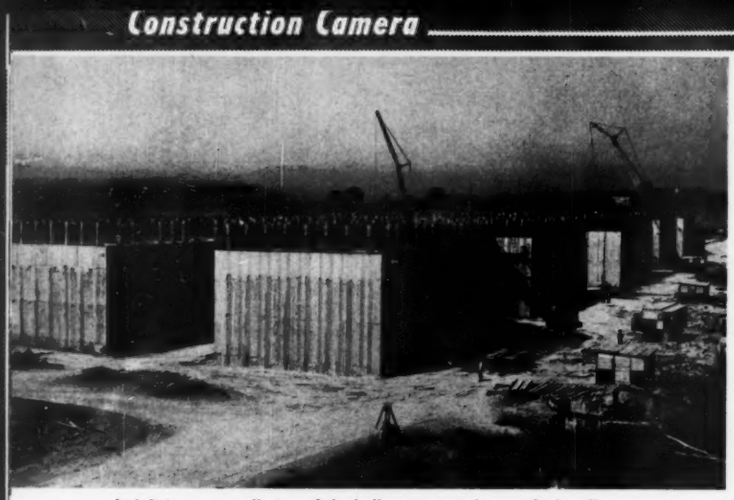

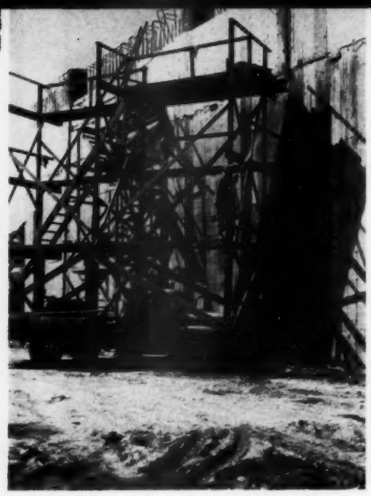

At left is an over-all view of the hollow concrete boxes which will serve as buoyant piers for the N. Y. State Thruway bridge across the Hudson, as they near completion ten miles upstream from the bridge site. Since the boxes will be sunk onto a blanket of sand, their construction joints were waterproofed at the construction site. Working from the scaffolding of Corbetta Construction Co.'s "Fifth Avenue Bus", a workman, center, hoses down a construction joint which has been treated with muriatic acid prior to being caulked. At right, a workman applies Du Pont Neoprene putty to a joint with his hands.

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Watertight Joints for Bridge Foundation

With Eight buoyant concrete caissons serving as pier foundations for the New York State Thruway bridge across the Hudson River, supporting 80 per cent of the span's dead weight, waterproofing their construction joints loomed as one of the more important parts of the project. The submerged concrete boxes (see "Buoyant Type Base Supports Bridge Piers", C. & E., Jan., 1954, pg. 62) will rest on the relatively soft bottom at the river's widest point. Four of these boxes measure 56 x 110 feet, two are 77 x 124.5 feet, and the largest is 110 x 190 feet. All will have a height of 40 feet when they are finished.

Cost factors dictated the use of a buoyant substructure for the three-mile-long span which will eventually connect Tarrytown and Nyack. The caissons were built by Corbetta Construction Co. in a pumped-out clay pit 10 miles upstream from the bridge site. They were then floated downstream where they will be flooded with water and sunk onto the river bottom. (See "Prefabrication Speeds Concrete Caisson Job", C. & E., July, 1953, pg. 10.) Steel piles, driven to bedrock through metal sleeves in the caisson walls, will hold the boxes in place and support that part of the load not resisted by the buoyant force of the water. Later, as supporting towers and the superstructure are erected, this water will be pumped out to counteract the added weight with their buoyancy.

Neoprene Putty Used

A neoprene putty was used to seal construction joints on the eight caissons rather than the conventional coal tar caulking compound. The putty is made by plasticizing neoprene synthetic rubber with a small amount of solvent and is produced by Gates Engineering Co., Wilmington, Del. Vulcanization accelerator is mixed into the material before it is applied, causing the neoprene to cure in place at atmospheric temperatures. After curing, the material becomes elastic, able to expand and contract with the concrete as the temperature fluctuates, and is firmly bonded to the concrete.

Prior to starting the job, check tests of the material were made so

Flood Control—Guniting the banks of the San Gabriel River basin in California is done by Macco Corp., Paramount, Calif. Chicago Pneumatic and Ingersoll-Rand rotary-type compressors, powered by General Motors diesels, produced up to 600 cubic feet of air per minute for this channel project.

Speed and Light—This Kohler electric plant permits round-the-clock work on the Ohio Turnpike. D. W. Winkleman, Inc., designed the I-beam base which holds plant and light tower.

Fast Concrete Placement—A Mixermobile mixes, hoists, and chutes concrete onto third-floor forms of barracks building under construction at Oceana, Va.

that it could be compared with other materials and evaluated under actual field conditions. A few feet of construction joint was caulked with regular coal tar compound, and the same was done with the neoprene putty. Several weeks afterward, the two compounds were subjected to sand blasting. Although the coal tar yielded readily, some of it peeling off in large chunks, the neoprene had to be removed with hammer and chisel. The putty, possessing a long working life of several hours after the accelerator is added, became tack-free within a few hours. Within 48 hours, about 80 per cent of its ultimate strength was developed. Since it does not sag and is resistant to oils and chemicals commonly found in river and harbor waters, it was well suited to the job of making these concrete boxes watertight.

Application

After the construction joints were sand blasted, they were etched with muriatic acid to remove the balance of surface mortar and expose aggregates. Then the joints were hosed down with water to wash away the acid. When the joint dried, a coat of clear primer was brushed over the concrete, and this in turn was followed by a coat of tie cement, applied when the primer was dry. Both primer and cement, furnished by the putty manufacturer, assured a good bond between the putty and the concrete.

Meanwhile, the neoprene putty was prepared for use. Workmen kept hands, spatulas, and drum lids wet with alcohol so that the material would not stick. After the vulcanization accelerator was poured over the material, it was mixed in by kneading the putty manually. The material was then applied to the joints by workmen using either their hands or a spatula.

Construction joints on both the inner and outer surfaces of the caissons were caulked with neoprene, the outside joints taking about 2 pounds per linear foot, while a quarter to one-half pound per foot was used on the inside joints. In all, about 860 pounds of the substance was required for the 330 of vertical construction joints.

THE END

Convention Calendar is on page 101

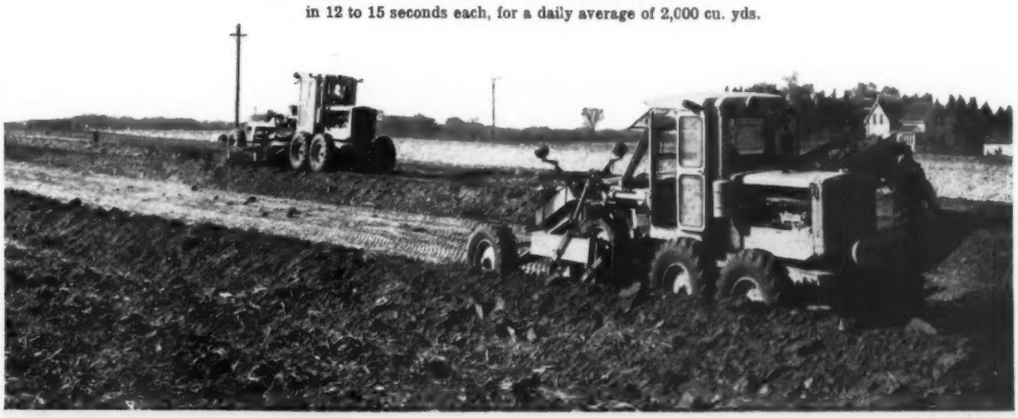
DOMOR ELEVATING GRADER

BUILDS ROADS
CLEANS DITCHES
STRIPS OVERBURDEN
LOADS AGGREGATE

FOR BENTON COUNTY, MINNESOTA

"I honestly believe we have paid for the DOMOR Elevating Grader in its first year of operation with its production record. It has proven to be our best and most economical way of getting soil selection in road construction," says Joseph D. Kolsmith, Benton County Highway Dept.

Last year Benton County's DOMOR Elevating Grader moved approximately 224,000 cu. yds. of material on 19 separate projects. On a recent road building job, the DOMOR was loading 5 cu. yd. trucks in 12 to 15 seconds each, for a daily average of 2,000 cu. yds.



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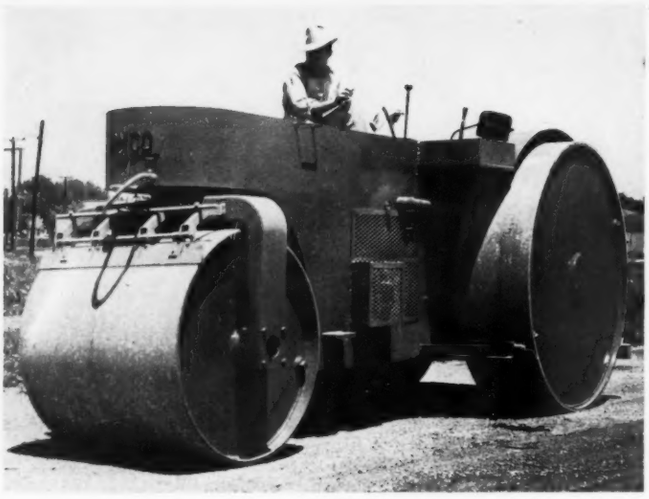


The Model TW-1012 BMCO 10 to 12-ton three-wheel roller has two seats and dual controls.

Three-Wheel Rollers Have Dual Controls

■ Two new models of three-wheel road rollers have been added to the line made by the Lewis-Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Texas. The new BMCO rollers are made with two seats and dual controls. The seats are located so that the operator sits up high enough to avoid having dust and dirt blown into his face. There is greater safety for the operator since he rides sideways in a seat instead of standing on a platform at the rear of the roller. In either the left-hand or right-hand seat, he has an unobstructed view of his work when the machine is traveling in either direction.

The roller line is offered in two sizes, including an 8 to 10-ton model and a 10 to 12-ton unit. Six-cylinder gasoline or diesel engines are optional on both models. Speeds of 1¼ to 5 mph are available for forward and reverse travel through a three-speed selective-type transmission and double-clutch reversing unit. The rollers have hydraulic-power steering.

Over-all rolling width on either model with 20-inch drive rolls is 6 feet 4 inches. Twenty-two and 24-inch-wide rolls are optional. Capacity of the sprinkler system is 100 gallons.

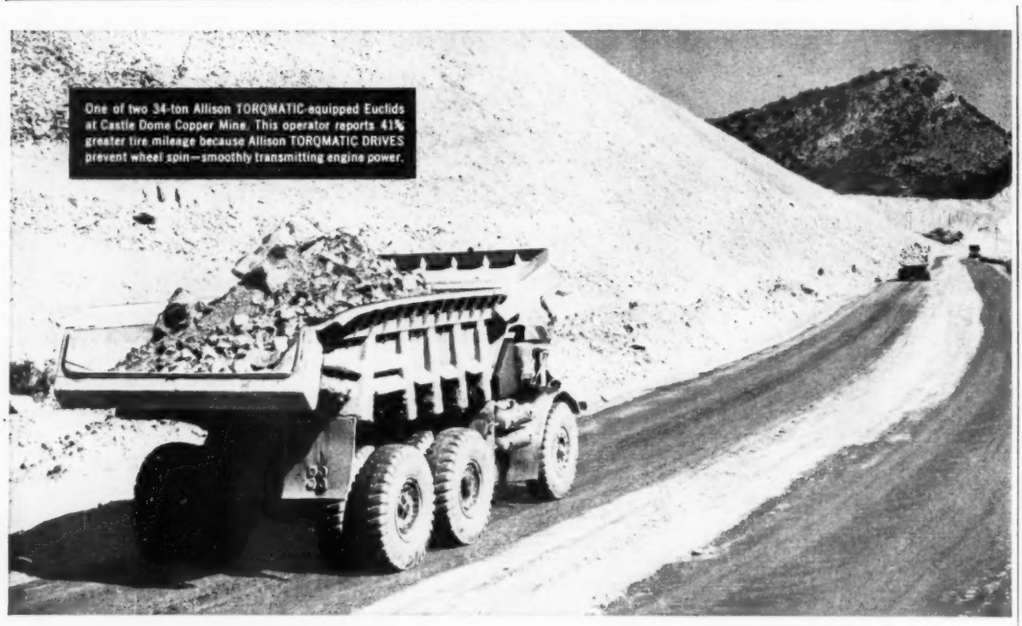
For further information write to the company, or use the Request Card at page 18. Circle No. 122.

Data on Flexible Tubing

■ Flexible lightweight tubing that can be used for dust collection, ventilation, and material handling is illustrated in literature from the Flexible Tubing Corp., Guilford, Conn. Spiratube consists of a preformed pre-pitched continuous spring wire helix secured between overlapping plies of spirally wound fabric-supported coverings.

The tubing is made in several types. Spiratube A is for portable and semipermament ventilation service, fume removal, and light dust-collection systems. It can be made with a scuff strip for extra wear when the duct is to be dragged over rough surfaces. Type R, for material handling, is made with greater resistance to corrosion or wear. Type K is for use wherever high resistance to heat conduction is required in the ducting of air or other gases. Type M, for mine and tunnel ventilation, is a jute-supported rubber that withstands punishment and resists rot and fungus.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 99.



One of two 34-ton Allison TORQMATIC-equipped Euclids at Castle Dome Copper Mine. This operator reports 41% greater tire mileage because Allison TORQMATIC DRIVES prevent wheel spin—smoothly transmitting engine power.

"41% longer tire life"

Castle Dome Copper Company reports it gets 17,000 miles per tire on off-highway trucks equipped with Allison TORQMATIC DRIVES compared to 12,000 miles per tire on mechanical-drive units. But increased tire life is only part of the story — the firm also reports the TORQMATIC-equipped "Eucs" have better availability and production records.

This operator runs a fleet of 12 trucks —2 TORQMATIC-equipped "Eucs" and 10 mechanical-drive units — hauling 390,000 tons of ore and overburden per month up 8% grades on mile-long runs. The "Eucs" average 25.3 trips per 8-hour shift, each hauling about 58,000 tons per month.

TORQMATIC DRIVES smoothly transmit engine power—help prevent wheel spin that can quickly strip the tread from a tire. There's no clutch pedal to push and only three forward gearshifts—instead of the usual 7 or 10 — handle all loads and grades. The *matched* converter-transmission team balances engine power and load demand, absorbs harmful drive-line shocks, prevents damage to drive-line components, helps stop engine lugging.

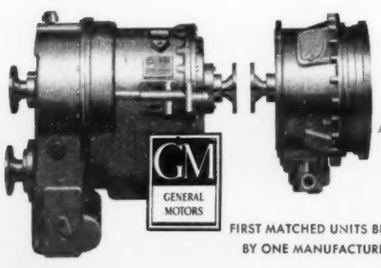
You, too, can cut your operating costs by specifying Allison TORQMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

Allison Division of General Motors
Box 894C, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

- **Cuts** driver training costs
- **Quick-Shifts** at full throttle with fingertip hydraulic control
- **Holds** power to load at all times — no clutch pedal to push—no gearshift guess
- **Reduces** maintenance costs by absorbing shock — eliminates engine lugging — prolongs equipment life
- **Only** torque converter-transmission team designed to work as a *unit* and built by one manufacturer



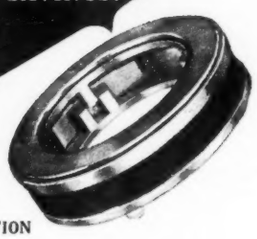
FIRST MATCHED UNITS BUILT BY ONE MANUFACTURER

Allison

TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES • TRUCKS TRACTORS • SCRAPERS • SHOVELS • DRILLING RIGS

REPLACEMENT PARTS for "CAT" TRACTORS at a SAVINGS!



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27-45 Jackson Ave.
Long Island City, N. Y.
Stillwell 6-5320
4001 Main Street
Bridgeport, Conn.
Bridgeport 68-1631

CALL OR WRITE

BOBKER BEARINGS

Wire-Rope Cutters

■ Two new shear-type tools for cutting steel cable and wire rope have been developed by H. K. Porter, Inc., Somerville, Mass. With passing jaws, notched to lock the cable in during the cut, these shears are said to be effective on all cable including ACSR, soft and hard rope, stranded guy wire, and improved plow steel up to Brinell 400 or Rockwell C 42 hardness.

The design of the tools reportedly minimizes the crushing or deforming of either coarse or fine-stranded cable in the cutting action. The No. 1 TN cuts cable through ⅜-inch diameter, and the larger No. 3 TN cuts cable through ⅝-inch diameter.

For further information write to the company, or use the Request Card at page 18. Circle No. 119.

Gravel Plant Features In-Line Material Flow

■ A booklet describing the recently announced Pioneer 35-S in-line portable gravel plant is now available. The brochure contains specifications and other details.

The in-line feature of the plant means that the basic flow of material is in line longitudinally with the axis of the plant, the material being fed into the rear and discharged at the front end. This is clearly explained in the booklet by use of a diagram tracing the flow of material through the plant.

The 35-S is a lightweight plant equipped with the largest units possible, while still complying with weight limitations. The manufacturer states that it was designed especially for those areas where weight restrictions are severe and where rapid and frequent moves are necessary. The plant can be pulled in and out of a gravel pit without dismantling or removal of conveyors or other accessories.

To obtain this literature write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., and request Bulletin 647, or use the Request Card at page 18. Circle No. 63.

Kits for V-Belt Drives

■ Open-end V-belting, fasteners, and tools offered in complete units are illustrated in literature from the Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill. The new Alligator equipment is available for A, B, C, and D drives.

The packaged material is particularly recommended for emergencies and eliminates dismantling when the correct endless V-belt is not on hand. An introductory B unit consisting of belt, fasteners, and applicator tool is described in detail.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 106.

BUY IT OR RENT IT . . .

No matter what type scaffolding your work requires, Bil-Jax has it . . . portable, rolling, or swing type. Tubular steel gives maximum safety, economy and satisfaction. Insist on versatile, re-usable Bil-Jax for all your scaffolding needs.

Write For **COMPLETE CATALOG**

20 pages of information on equipment and erection plus safety suggestions to cut your scaffolding costs. Address Dept. C-3.

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Hoisting towers, steel ladders, ladder jacks, putlogs, leveling jacks, scaffold brackets . . . accessories.

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GETS YOU UP IN THE WORLD
BIL-JAX INC.
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WYCO 2 H.P. UNIVERSAL ELECTRIC MOTOR VIBRATOR

Place Concrete faster! Light - Powerful

WRITE FOR CATALOG WYCO GASOLINE AND ELECTRIC VIBRATORS

$297.00 UP FOB CHICAGO

WYZENBEEK & STAFF, INC.
223 NO. CALIFORNIA AVE. CHICAGO, ILLINOIS

3 Walers on 16' Wall

Henry Carlson Const. Co., Sioux Falls, S. D., used only 3 walers with Symons Forms on 16' high 12" thick wall for City Water Treatment Plant. 10,000 square feet of Symons Panels were reused 12 times on the job, resulting in savings of labor, material and fast forming.

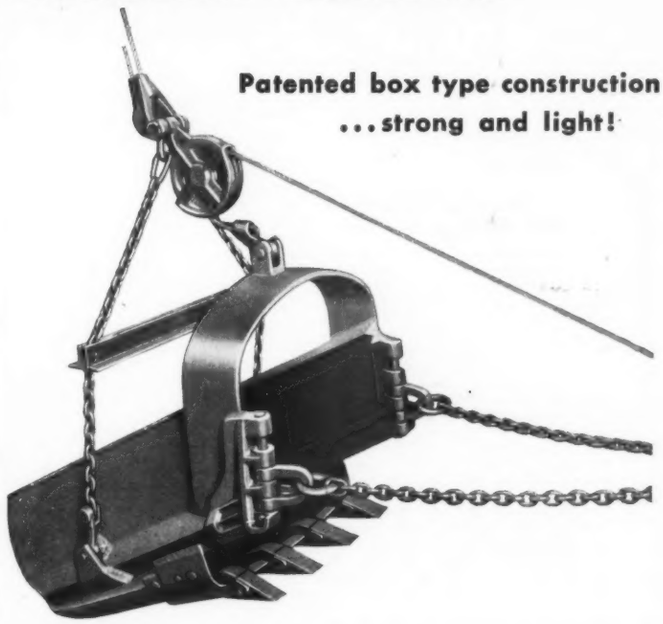
To pour these high walls certain upper panels were raised 1 foot to permit pouring through side openings, for the first 8 feet of concrete.

Send the plans for your next job and get complete layout and cost sheets—no obligation. Catalog F-9 available on request. Symons Clamp & Mfg. Co., 4251-C-4 Diversey Ave., Chicago 39, Ill.

Make more profits with

WELLMAN-WILLIAMS DRAGLINE BUCKETS

Patented box type construction ...strong and light!



THE Wellman-Williams Dragline Bucket is perfectly balanced, light in weight, has a wide digging radius and hitch connections for fast adjustment of digging depths. Alloy steels provide maximum strength with minimum dead weight. Teeth are made of manganese steel and are reversible. Perforated type dragline buckets also available.

It's a WELLMAN—built to dig and last while digging.

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Please send me a free copy of bulletin on:

☐ Clamshell Buckets ☐ Stone Grabs
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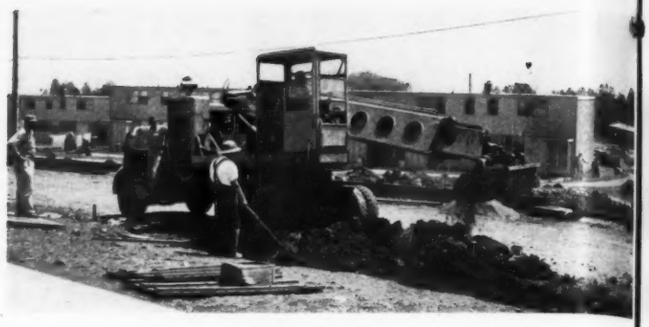
Facilities Are Built For New Communities



The trench for the concrete curb and gutter is prepared by a Gradall mounted on an International KB-8 truck.

C&E Staff Photo

THE GROWING IMPORTANCE of taconite as a source of iron ore is changing sections of Minnesota's northeastern wilderness into communities almost overnight. As the supply of deposits of high-grade ore dwindles, the unmeasured supply of taconite is speedily civilizing what, up to very recently, has been virtually virgin territory.

The expansion of the Reserve Mining Co. taconite mine at Babbitt and the construction of processing facilities at East Beaver Bay on the shore of Lake Superior, along with a 47-mile railroad connecting the two points (See "Iron-Bearing Taconite Sets Off Construction Boom", C. & E., Feb., 1954, pg. 44) is creating a pair of new communities. Where bears, rabbits, chipmunks, and an occasional deer made their homes in the rocks and wooded hillsides less than three years ago, modern dwellings, sewer and water systems, paved streets and sidewalks, and power facilities are now being built.

East Beaver Bay

East Beaver Bay is to be the larger of the two Reserve Mining Co. communities. The town site lies on a rugged hillside. The main street at the lowest elevation connects the several groups of residential streets and provides access to the nearby truck highway. The residential areas are arranged in semicircles, affording most families a pleasant view of the lake. The layout makes it possible for small children to reach the schools and play areas without crossing more than one main thoroughfare. A centrally located 40-acre plot will contain the high school, civic center, shopping center, and other community services.

The area consisted of brushy wooded forest. Caterpiller D8 tractors equipped with tree dozers cut down the larger trees and brush to get the project under way. The remaining stumps, brush, and the spongy layer of roots and humus were cleared by dozers, exposing the soggy subsoil. Once exposed to the sun and air, the ground began to dry quickly. This work, plus the later grading and surfacing of streets, curbs and gutters, and sidewalks, was done by the joint venture of Hunkin-Arundel-Dixon—The Hunkin-Conkey Construction Co., Cleveland, Ohio; the Arundel Corp., Baltimore, Md.; and the L. E. Dixon Co., San Gabriel, Calif.

The Cherny-Sundland Co., Ironwood, Mich., installed the water and sewer mains before the grading of the streets. By the time the sites for the 1,200 homes were prepared, more than 80,000 feet of 8-inch water main and 70,000 feet of 8 and 12-inch sanitary sewer were placed.

Water and Sewage

The water system consists of a pumping and treatment plant on the shore of the lake with an intake structure more than 300 feet offshore

Need more tons of asphaltic concrete for Superhighways, Airports, Turnpikes Expressways, Big-city Markets?

Cedarapids Built by IOWA

NEW 6000-LB.

MODEL G-60

BITUMINOUS MIXING PLANT

3 TONS PER BATCH MEETS BIGGEST DEMANDS . . . CUTS PRODUCTION COSTS!

BIG FEATURES FOR THE BIG JOBS

Fully automatic controls (optional). Weighs, batches, mixes, discharges and starts new cycle without operator, gives up to 10% increase in capacity. ● Progression indicator lights insure accurate batching. ● 60-cu. ft. mixer capacity BELOW center line of shafts gives 6000 to 6500-lbs. per batch! ● Welded steel mixer body fully jacketed. Liners of ⅝" manganese steel built in sections for easy replacement. Two U-shaped manganese castings around discharge gate protect mixer body from wear. ● 7" diameter heavy-duty mixer shafts. Spherical, self-aligning bearings rest on heavy H-beams which transmit load to main structure, eliminate strain on mixer ends. Bearings placed away from mixer body for cool running and maximum life. Generously sized anti-friction bearings used throughout plant. ● Efficient "runaround" paddle arrangement. New rigid bar-type double paddle arms, with wear-resisting floating removable sleeves, extend completely through mixer shafts. ● Smooth-running 4' x 14' horizontal vibrating screen produces 4 sizes, plus oversize, has plenty of reserve capacity. Specially adapted for asphalt plants with power unit placed in the open on end of screen, out of heat and dust. ● Rigid heavy-duty columns and structure throughout for minimum vibration. All columns and bracings interchangeable. ● All wiring meets National Standards Association latest specifications. ● Highly portable. Each component unit has its own running gear and erection device. Plant can be erected from columns to hot elevator in less than two days. ● Equipped with 4-compartment cold aggregate storage bin and positive, proportioning type of feeder. ● Asphalt bucket of ¼" plate entirely jacketed. Asphalt spreader pan runs entire width of mixer. ● Pneumatic controls eliminate operator fatigue, speed cycle time in manual operation. ● All hot elevator bearings mounted outside of enclosure for maximum life and easy access for lubrication. ● Exceptional freedom from dust with "scavenger" system and plant design for "breathing" within itself. ● Capacity conservatively rated 150 tons per hour, depending on mixing cycle time.

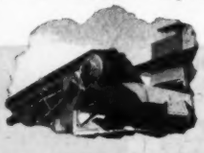
TODAY's big bituminous paving jobs demand increasingly higher tonnage output of asphaltic concrete. That's why Cedarapids designed the 6000-lb. Model G-60 . . . so you can meet those increased tonnage demands fast, and make a higher profit on each ton produced! Every feature in this new Cedarapids plant is designed for big production . . . 180 tons per hour and more, with completely automatic controls. Every unit in the G-60 is quality-built for the balanced, efficient, long-life performance that keeps maintenance costs low.

Your Cedarapids distributor will gladly tell you the full story of the Model G-60 high-production, high-profit performance. See him today.

IOWA MANUFACTURING COMPANY ● Cedar Rapids, Iowa, U.S.A.

Commander Crushing and Screening Plant

Vibratory Soil Compactor



Motorized Head Pulley

Master Bituminous Mixing Plant

GET the AMAZING FACTS ON THE PATENTED TROUBLE-FREE BALL BEARING TURNTABLE

Exclusive WITH LITTLE Giant CRANES SHOVELS TRENCHOES!

½, ¾, 1 Yd.

LITTLE GIANT CRANE & SHOVEL, INC.
1520 HOWARD DRIVE, DES MOINES, IOWA

Water mains, sewers, curbs, gutters, streets, and sidewalks to serve Minnesota mining towns

Workmen shovel select backfill into the water-main trench as the Trackson unit on the International TD-9 prepares to swing another section of pipe into place. In the background, a Lima Paymaster backhoe is excavating. *C&E Staff Photo*

and 90 feet deep. Two sand filters and a chlorinator purify the water before it is pumped through 5,000 feet of 14-inch main to an elevated storage tank on the hill above the town. All water is pumped to the tank and distributed throughout the area by means of a system of automatic pressure-control valves maintaining approximately 40 pounds pressure.

The 150,000-gallon elevated steel storage tank was built during the 1953 season by the Chicago Bridge & Iron Co., Chicago, Ill. As the city expands, a second tank will be erected.

A sewage-treatment plant receives all the town's sewage through a network of vitrified clay-pipe sanitary sewers. In the plant, a bar screen and comminutor remove the larger material. The sewage then passes through a primary settling tank, a trickling filter with rock media, a secondary settling tank, and a chlorinating chamber. The sludge is collected, digested, and dried. Because of the hillside location, the only pumping needed for the system is to maintain the flow through the filters.

Laying the Pipe

On a typical sewer line job, the trench was dug by a Bay City ¾-yard backhoe. Pipes were lowered and placed by hand. Selected backfill was also placed by hand. The balance of the trench was dozed full. On a typical water main installation, a Lima Paymaster backhoe dug the trench. Pipe was placed by an International TD-9 with a Trackson swing crane. Selected fill was placed by hand, and the trench was filled by dozer.

After the pipe systems had been installed, the streets were brought to subgrade by dozers, tractor-drawn scrapers, and motor graders. The roadways were built up with 15 to 18 inches of coarse, quarry-run, crushed rock topped by a course of graded crushed rock which was given a road-oil treatment.

The curbs, gutters, and sidewalks were placed as the road work progressed. A Gradall mounted on an International KB-8 truck excavated the trench for the curb and gutter sections. Steel forms were set by hand. Concrete was delivered to the pour in 4½-cubic-yard Worthington truck mixers mounted on International R-190 trucks. By the

(Concluded on next page)

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today

THE SLOPE-METER CO. OIL EXCELSIOR, MINN.

Save this page . . .
. . . if the
CONSTRUCTION OF
CURBS and GUTTERS
IS PART OF YOUR BUSINESS
Heltzel Curb and Gutter Forms (with multi-style face) permit contractors to meet any cross sectional requirement. And optional methods of supporting face allow contractors to meet any construction specifications.
For almost 50 years Heltzel has been furnishing construction people with strong, quick-setting, fast-stripping, versatile forms that make concrete forming easier, faster and less expensive.
On this page is a sampling from the world's most complete line of modern steel forms . . . designed and built by the nation's leading manufacturer of forms for concrete construction.
Two of the many variations possible with the popular Helco Basic Forms. These forms are designed to permit contractors to work an almost endless variety of curbing styles from the same basic set. All Helco Basic Forms are made of long lasting tough carbon manganese steel in 10' sections.
For curb work 12" to 24" in height, Heltzel has designed a heavy duty dowel joint form that has found ready acceptance in the field.
For partially battered curbs Heltzel can furnish either one or two piece front forms depending on your job requirements.
Heltzel builds a complete line of Radius Forms—either Rigid or Flexible. All forms are built to exact cross sectional specifications. Flexible Radius Forms are ideal for serpentine work for parks, etc.; Rigid Forms for repetitive curve pours where the radius is constant.
CONTRACTORS AND MUNICIPAL ENGINEERS: Today's high labor costs make the use of steel forms almost a necessity. You'll find that Heltzel can provide by far the widest variety of either standard or special forms.
If you don't already have Heltzel Form Bulletin L-20, get your copy today by writing The Heltzel Steel Form and Iron Company, Warren, Ohio.
—Naturally It's A— Heltzel Product —
Heltzel
Flex-Plane

A new rock-drill attachment for the Pippin excavator.

Rock-Drill Attachment For Excavating Unit

■ A rock-drill attachment for its tractor-mounted excavator is announced by Pippin Construction Equipment, Inc., White River Junction, Vt. This attachment carries 3, 3½, or 4-inch drifter of the wagon drill type mounted at the end of the dipper stick of the Pippin excavator. By a simple fingertip manipulation of the hydraulic controls, the drill can be moved from horizontal drilling high up the rock face to toe-hole drilling, to drilling close to the face, or to vertical drilling. The 1,000-psi hydraulic power allows rapid movement of the drill from hole to hole and also maintains a stable setup for drilling in any position. Up to 20 holes with 5-foot spacings are possible from one location.

The rig has a side swing of 120 degrees that provides a reach over a 25-foot-wide area, 12½ feet either side of center. It can drill horizontally into rock faces up to 15 feet above the ground. Back reach is 16 feet from the center of the tractor's rear wheels. Maximum hole depth is 20 feet with 6-foot steel changes.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 32.

Lighting Equipment For Emergency Use

■ Emergency lighting equipment that has two 5,000-candle-power sealed-beam lamps is available from Sentry-Lite, 55 Front St., Rockville Centre, L. I. The Model 200 X Sentry-Lite provides 10,000 candle power or more of emergency lighting to illuminate large areas when the regular lighting source is interrupted. The unit is housed in a steel case that contains a special 100-amp storage battery. It can give more than 12 hours of continuous service.

A special feature of the equipment is the automatic recharging of the battery from the regular electrical circuit while the emergency equipment is not in operation. The automatic recharger keeps the battery up to peak capacity at all times. The complete unit weighs 60 pounds including battery. It's dimensions are 8 x 13 x 16 inches.

For further information write to Mr. Alfred G. Freeman, Chief Sales Engineer at Sentry-Lite, or use the Request Card at page 18. Circle No. 78.

(Continued from preceding page)

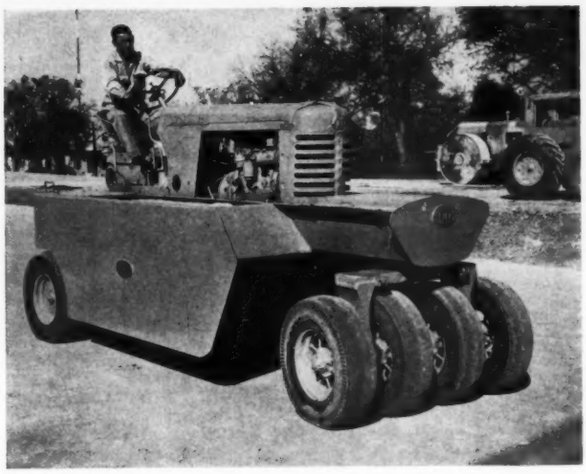
time all construction is completed, there will be more than 15 miles of streets.

Housing units for 64 families were constructed in the 1952 season. These homes are being used by the construction workers. Temporary buildings are being used for stores, the elementary school, and other necessary facilities. The 1953 program called for the erection of the first permanent elementary school, together with 300 additional homes. As the industrial facilities grow, additional homes and buildings will be added to the town until all the families of plant personnel are housed.

Personnel

East Beaver Bay is being built by John W. Galbreath & Co. The firm has planned the community, is supervising its construction, and is handling the rental and sale of the homes. It will also act as community manager. THE END

They're here now! **28,000-lb. HD-15's with torque converter drive are already rolling off the assembly line.**



The new Tampo Model SP9 self-propelled pneumatic-tire roller is shown compacting sub-material. Power comes from a 31-hp engine. ▶

Self-Propelled Rubber-Tire Roller Travels Both Forward and Backward

■ The first self-propelled pneumatic-tire roller to be introduced to the construction industry has been announced by the Tampo Mfg. Co., 1146 W. Laurel St., San Antonio 6, Texas. A nine-wheel roller with a 72-inch rolling width, it has two working speeds of 2½ and 4½ mph in both forward and reverse and two forward travel speeds up to 12 mph. The equal working speeds eliminate turn-arounds and save production time. A short wheelbase and hydraulic power steering also add to the maneuverability of the unit. Maximum wheel load is 2,000 pounds or 250 pounds per linear inch of rolling width.

The Tampo Model SP9 is built either as a sand-ballast or as a water-ballast roller, and optional equipment is available to suit varying job requirements. A detachable towing tongue is furnished so that the roller can be towed behind a truck when desired for transport.

The drive is through a standard differential to a special type of roller chain operating on machine-cut steel sprockets. There is one chain drive to each outside pair of rear wheels and differential locking is provided so the roller will not become mired with one set of wheels in wet or soft material. The drive chain was selected to withstand the high torque and shock loading to which this type of equipment is subjected. The chain cases are enclosed and lubricated, and chain adjustment is adequately provided for.

The drive wheels are nonoscillating for proper flotation in loose material. The manufacturer points out that this results in higher tractive effort available for hard pulls in base material compacting operations.

The 31-hp engine, the transmission, and the differential are of standard industrial tractor construction. The drawbar pull is reported to be more than sufficient to self-load the fully ballasted roller up a short ramp to any trailer bed. Traction for rolling all types of fill material is reportedly high and is increased by the flotation of the double drive wheels. Engine horsepower is sufficient to handle the fully ballasted roller on grades and approaches at all proper rolling speeds.

For further information write to the company, or use the Request Card at page 18. Circle No. 51.

Allis-Chalmers Powerful HD-15 adds to its big work advantages

. . . now offers choice of two outstanding drives— standard transmission with time-saving shift pattern, or widely accepted hydraulic torque converter drive

From its introduction, the Allis-Chalmers HD-15 has set new standards in performance and long-life service . . . in a new size class. It combines outstanding strength and balance with plenty of power, plus a simplified, time-saving transmission that gives big work output. In addition, the HD-15 offers remarkable service simplicity, with features like unit assembly and 1,000-hour lubrication intervals for truck wheels, idlers, and support rollers. It has proved itself the kind of tractor required on today's jobs.

Now, hydraulic torque converter drive is added as optional equipment — an additional working advantage for the powerful HD-15. This advanced design drive was introduced by Allis-Chalmers in the world's *first* torque converter tractor nine years ago. This modern drive gets more done because it automatically provides the right combination of speed and pull every working minute . . . and hydraulic cushioning assures longer life for both tractor and auxiliary equipment.

Now you can choose the HD-15 with standard transmission *or* hydraulic torque converter drive. Either way you'll be getting the most advanced tractor in the business. Let your Allis-Chalmers dealer give you *all* the reasons why.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

TORQUE CONVERTER *Symbol of greater output, longer life.*

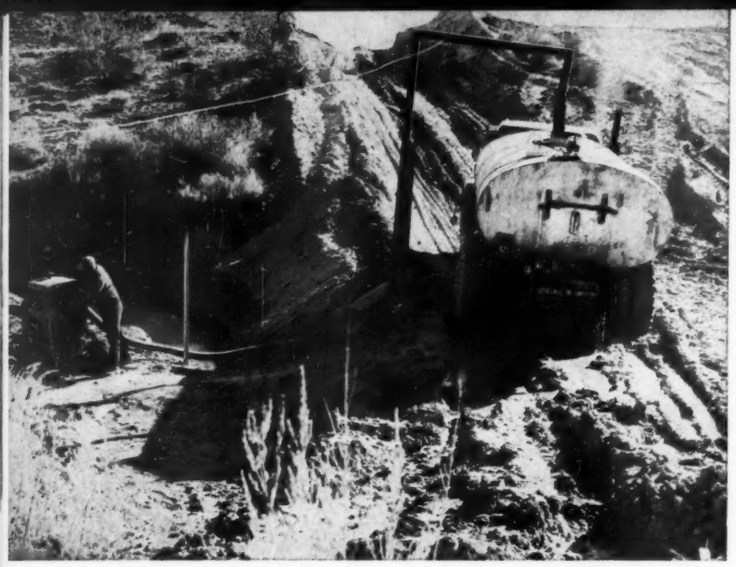
Booklet on Accessories For Pneumatic Tools

■ A folder illustrating and describing pneumatic tool accessories is available from Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. The booklet covers moil points, clay spades, asphalt cutters, carbide rock-drill bits, and drilled-steel lines. Specifications covering all tools are included as well as application information.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 116.

Excavating Equipment Film

A new color-sound movie, "The Big Lift", deals with the importance of the excavating equipment industry. Released by Baldwin-Lima-Hamilton Corp., construction equipment division, the 29-minute 16mm film is available on loan to clubs, associations, and student and engineering groups. Information concerning a screening of the picture can be obtained by writing to the company's sales promotion department in Lima, Ohio.



Water for the fills was obtained from a nearby spring. Here, a Wisconsin-powered Rex 4-inch pump fills a 3,000-gallon tank mounted on a Kenworth truck. *Ray Day Photo*

Heavy Grading Required For

Over 700 holes are drilled into basalt ridge crest for a 12-ton blast in the removal of deep cut

A ROCK BLAST which took six weeks to set up and consumed 12 tons of high explosives was the highlight of the first stages of a $400,000 highway relocation project which will realign 2½ miles of U. S. 91 in southern Utah. The job is being done by Whiting & Haymond, Springville, Utah. Started early in October, 1953, it is scheduled for completion by about May 1 of this year.

Construction of the St. George relocation of U. S. 91 will eliminate one of the worst danger spots on Utah's principal north-south route. The area is a land of rugged mountains, deep washes, hard lava ridges, and otherwise rough terrain. In the path of the highway, just east of the city of St. George, is a long high finger ridge which extends from the mountain range north of town. Capped by 25 feet of hard basalt, the ridge has long defied natural erosion processes. About 300 feet wide at the top, it slopes at a natural angle of repose, approximately 1 to 1.

In 1925, a concrete-lined tunnel with 10 to 13-foot clearance was drilled through a narrow part of the ridge. As motor vehicles became larger, the tight clearance became a major problem. Also, the winding approaches to the tunnel were very hazardous.

Build Highway Over Top

In the late 1930's, a temporary bituminous highway was built over the top of the ridge. It, too, meandered dangerously. The new highway will eliminate the dangerous section. Beginning at the outskirts of St. George, it will pass, on a fairly straight line, through a corner of the ridge by means of a cut 126 feet deep, measured vertically.

Plans for the highway called for a 44-foot roadbed with ½ to 1 slopes in the deep rock cut and 4 to 1 slopes in the shallower earth sections. Some adjustments of the deep cut slopes were necessary because excavation showed the basalt cap rock to be resting on much softer material.

Six inches of gravel base course is now being placed over the full width of the roadbed. This is to be topped by 6 inches of select gravel surface material known as Type A. The upper 2½ inches will be road-mixed with MC-3 asphalt to form a dense cake. The job will be completed when the surface is sealed with asphalt and chips. The Whiting & Haymond contract covers all phases of grading, drainage, production and placement of subbase, and bituminous road-mixing.

Since the job intersects several large drainage courses, a considerable number of drainage structures are involved. These include a 178-foot structural plate pipe culvert 150 inches in diameter. Of five-gage metal, the culvert was supplied by Armco. There will also be a 60-inch pipe 210 feet long and numerous smaller corrugated metal pipe drains.

Earth Formation Misleading

Contractors who examined the lava ridge prior to making a bid on the contract found what was ostensibly a formation of basalt with little indication of anything softer underneath. The Whiting & Haymond investigators, however, after interviewing local residents, were fairly certain the cap was covering softer material. With a bid based on this assumption, the firm was awarded the contract.

The three Caterpillar D8's—the one in the center is the new D8 Pusher—muck out the blasted basalt after the big shot, which consumed 12 tons of powder. *Ray Day Photo*

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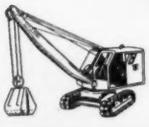

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ed For Highway Realignment

A section of the 150-inch Armco structural plate pipe, part of a 178-foot drainage culvert. The highway relocation intersects several large drainage courses. *Ray Day Photo*

The first step in the weeks of preparation prior to setting off the blast in the 126-foot cut was the construction of a temporary road from the tunnel, over the top of the ridge, to the cut location. Over this access road, the drilling equipment moved in. Among the pieces of machinery used were a pair of Gardner-Denver wagon drills, a Gardner-Denver 500-cfm compressor powered by a Caterpillar D13000 diesel, a G-D 350-cfm compressor, and four G-D jackhammers for the secondary or shallow shooting.

Whiting & Haymond enlisted the aid of the Atlas Powder Co. in planning the big blast. An Atlas representative visited the site several times and was a great help in setting up the hole pattern and blasting procedures. The pattern consisted of 2½-inch-diameter bottoms drilled on a 5-foot square grid. Using 20 to 24-foot Timken steel and rock bits, the wagon drills cut the holes at an average rate of 200 to 240 linear feet per drill per 8-hour shift. Bits were usually dulled after about 60 feet. They were shipped to Salt Lake City, Utah, for resharpening and tempering in groups of 50 to 100.

The major blast utilized 764 holes, covering an area through the ridge crest 200 feet wide. The holes were loaded with 23,800 pounds of Atlas No. 4 Flo-Dyn powder, and no springing was done. The shot was arranged for a series hookup using Atlas Rockmaster delays up through No. 7. The delays were set up so that the force of the explosion would break the cap rock at the edges first, throwing the material outward. The delayed rows were also to break outwardly, giving as much fracture as possible. Supervising the procedure was the Atlas representative.

Minor Secondary Blasting

A portable light plant set off the blast, which proved to be completely satisfactory. The jackhammers then moved in to drill holes for the secondary blasting, primarily along the cut slopes. These holes were loaded with light charges of gelatin cartridges.

When the basalt cap cracked open, the judgment of the Whiting & Hay-

(Concluded on next page)

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Cave-ins of trenches and other excavations can be dangerous and costly. Don't take chances with old timbers or other make-shift devices. See your local distributor for details on prices and delivery of the various types of precision-made, sturdy, Duff-Norton adjustable trench braces and timber fittings . . . or write the world's oldest and largest manufacturer of lifting jacks for bulletin AD-17S. The Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

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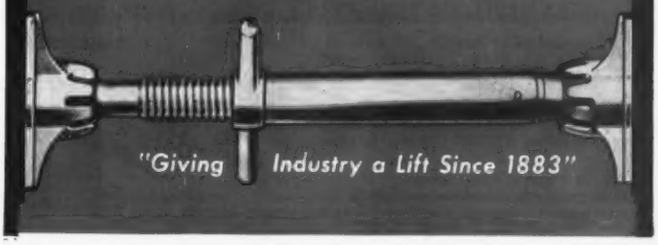

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LOUISVILLE Safe-Weight ALUMINUM PRODUCTS

(Continued from preceding page)

mond investigators was upheld. Underneath was a formation of sandstone, loose sand, sandy silt, and red clay. Three Caterpillar D8's quickly made their way down through the lava and were soon working on the softer material. Some ripping was required as the excavation neared grade, but the bulk of the grading was not too difficult.

The excavation of the cut material was so arranged that the rock was first blasted or dozed into the bottom of nearby fills. The softer material was spread over the rock in 6 to 8-inch lifts by the three Caterpillars and compacted with sheepsfoot rollers. By continuing this method of spreading and compaction out over the top of the rock fill into the earth embankments beyond, a good strong subgrade was assured.

One of the three Caterpillars moving the material was the stepped-up improved version of the standard D8. Called the Pusher, it weighs 51,000 pounds, 9,000 pounds more than the conventional model. A new type oil clutch engages and disengages with only 14 pounds of pressure, one-fourth the pressure needed on the standard machine. This reduction is made possible through a hydraulic booster. Clutch adjustments on the new model can be expected only about twice a year, eliminating some of the maintenance time for this part.

Larger Power Plant

Side members of the new rig are composed of 5,100-pound solid steel members, 4 x 4½ inches, which support the engine. Steering clutches have been redesigned to operate from a spiral gear, and clutch-release pressure has been reduced by 50 per cent. The improved power plant turns out 180 drawbar hp, an increase of 30 hp over the standard model. The rig performs exceedingly well, using a Caterpillar U-type dozer. Its design makes it especially adaptable to pushing scrapers.

As drillers and powdermen worked on the basalt ridge, other workmen were busy on adjacent areas of gentler terrain. Cuts and fills of 15 feet were shaping up into a more than adequate roadbed. Three LeTourneau - Westinghouse Tournapulls, a pair of Southwest sheepsfoot rollers, and two Kenworth trucks with 3,000-gallon water tanks were involved in this work. Wisconsin-powered Rex 4-inch pumps supplied the trucks with water from a nearby spring. Specifications called for a modified AASHO density rating of 95 percent on the finished subgrade. A great deal of care was exercised in laying the earthwork in 6-inch lifts, applying the necessary moisture to bring it up to its optimum content of 11 per cent, and getting the required compaction.

The material on those parts of the job not connected with the lava ridge consisted generally of red sandy clay. On long straight stretches it was handled by the Tournapulls, a dozer, the water-tank trucks, and the sheepsfoot rollers. Around the drainage pipes and structures, a Gardner-Denver 365-cfm compressor and Chicago Pneumatic hand tampers did the compacting.

St. George is about 250 miles from Springville, the home of Whiting & Haymond. This has helped provide excellent maintenance facilities for the equipment at the site of the project. A central shop with several mechanics takes care of routine maintenance. Fuel and lubrication is brought to the equipment in the field by a lubrication unit mounted on an International truck. Included in this equipment is a Briggs & Stratton-driven Champion air compressor, a Homelite electric generating set, a 500-gallon diesel tank, gas drums, lubricating oil and grease drums, an Alemite pressure lubricating system, and Alemite volume pumps for track rollers. Major repairs are being handled by hauling the equipment to Springville in low-bed trailers.

The production and installation of the gravel subbase is under way. Plans call for the use of a Wood Roadmixer for mixing out the bituminous job.

Personnel

The project is under the general supervision of E. G. Johnson, chief engineer of the Utah State Road Commission. S. Frick is construction engineer, R. A. Gillis is district engineer at Cedar City, and Ben Lie is resident engineer. Art Crammer is general superintendent for Whiting & Haymond, and Ralph Connors represented the Atlas Powder Co.

THE END

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1873

Convention Calendar

March 1-4 AGC Convention
Thirty-fifth Annual Convention, Associated General Contractors, Statler and Biltmore Hotels, Los Angeles, Calif. Mr. C. I. Mehl, administrative assistant, AGC, 1227 Munsey Bldg., Washington, D. C.

March 3-5 New York State Assn. of State Highway Engineers
Annual Convention, New York State Association of State Highway Engineers, Headquarter—Arlington Hotel, Binghamton, N. Y. Joseph Scott, chairman of reservations, P.O. Box 1001, Binghamton, N. Y.

March 10-11 Kentucky Highway Conference
Meeting, Kentucky Highway Conference, College of Engineering, University of Kentucky, Lexington, Ky. R. E. Shaver, professor of civil engineering, University of Kentucky, Lexington, Ky.

March 10-12 American Society of Mechanical Engineers
International Meeting, American Society of Mechanical Engineers, Hotel Del Prado, Mexico City, Mexico. Mr. Ernest Hartford, deputy secretary, ASME, 29 W. 39th St., New York 18, N. Y.

March 10-12 Association of Highway Officials of North Atlantic States
Meeting, Association of Highway Officials of North Atlantic States, Shoreham Hotel, Washington, D. C. A. Lee Grover, secretary-treasurer, 1035 Parkway Ave., Trenton, N. J.

March 15-19 National Assn. of Corrosion Engineers
Meeting, National Association of Corrosion Engineers, Kansas City Muncipal Auditorium, Kansas City, Mo. A. B. Campbell, executive secretary, 1061 M & M Bldg., Houston 2, Texas.

March 22-24 American Congress on Surveying and Mapping
Fourteenth Annual Meeting and Exhibit, American Congress on Surveying and Mapping, Shoreham Hotel, Washington, D. C. Helmuth Bay, general chairman, Rand McNally & Co., 1104 National Press Bldg., Washington, D. C.

April 5-7 American Society of Lubrication Engineers
Annual Meeting and Exhibit, American Society of Lubrication Engineers, Netherland Plaza Hotel, Cincinnati, Ohio. William P. Youngclaus, Jr., administrative secretary, 84 E. Randolph St., Chicago, Ill.

April 5-9 Greater New York Safety Council's Convention and Exposition
Twenty-fourth Annual New York Safety Convention and Exposition, Hotel Statler, New York, N. Y. Paul F. Stricker, executive vice president, Greater New York Safety Council, 60 E. 42nd St., New York, N. Y.

April 6-8 Ohio Highway Engineering Conference
Ohio Highway Engineering Conference, Museum, Ohio State University, Columbus, Ohio. Emmet H. Karrer, professor of highway engineering, Brown Hall, Ohio State University, Columbus 10, Ohio.

April 7-9 South Dakota Highway Short Course
South Dakota Highway Short Course, Union Building, South Dakota State College, Brookings, S. Dak. Emory E. Johnson, professor of civil engineering, South Dakota State College, Brookings, S. Dak.

April 13-14 American Institute of Steel Construction
Sixth Annual National Engineering Conference, American Institute of Steel Construction, Hotel Schroeder, Milwaukee, Wis. L. Abbett Post, executive vice president, American Institute of Steel Construction, 101 Park Ave., New York, N. Y.

April 13-14 Earth-Moving Industry Conference
Conference, Earth-Moving Industry, Pere Marquette Hotel, Peoria, Ill. J. W. Carter, Research Department, Caterpillar Tractor Co., Peoria, Ill.

April 19-22 Purdue Road School
Purdue Road School, Memorial Union Building, Purdue University, West Lafayette, Ind. Ben H. Petty, professor of highway engineering, Civil Engineering Bldg., Purdue University, Lafayette, Ind.

April 26-28 American Wood Preservers
Annual Meeting, American Wood Preservers Association, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J. For information, write to W. A. Penrosé, secretary-treasurer, AWPA, 839 17th St., N. W., Washington, D. C., and for reservations, contact C. C. Calvin, chairman, Hotel Committee, AWPA Arrangements Committee, 887 Suburban Station Bldg., Philadelphia, Pa.

April 28-May 1 American Society of Civil Engineers
Seventh Annual Pacific Southwest Conference, American Society of Civil Engineers, Hotel Senator, Sacramento, Calif. R. Robinson Rowe, general chairman, 2701 Third Ave., Sacramento 18, Calif.

May 3-8 Wire Reinforcement Institute
Annual Spring Meeting of the Board of Directors and Members of the Wire Reinforcement Institute, Boca Raton Hotel, Boca Raton, Fla. Frank B. Brown, managing director, Wire Reinforcement Institute, Inc., 1049 National Press Bldg., Washington 4, D. C.

May 3-8 Concrete Reinforcing Steel Institute
Annual Meeting, Concrete Reinforcing Steel Institute, Boca Raton Hotel, Boca Raton, Fla. H. C. Delzell, managing director, 38 S. Dearborne St., Chicago, Ill.

Engineer Joins Teco

A new structural engineer has joined the staff of the Timber Engineering Co., Washington 6, D. C. J. A. Reidelbach will be responsible for designing clear-span timber roof trusses, and assisting in planning and building modern-engineered wood structures.

Math Service Moves

The Mathematical Computing Service, formerly located at 105 Court St., Brooklyn, N. Y., is now in new quarters at 67-24 211th St., Bayside 64, N. Y.

The firm specializes in performing services for industries desiring complex engineering calculations, charts, monographs, and in the treatment of related mathematical problems.

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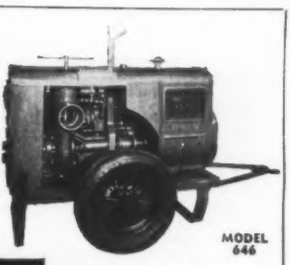
A sure way to save money on your next wellpoint job is to get Foundation's new 4" 1000 GPM capacity pump . . . sturdy, compact, for medium and small wellpoint jobs. Why use big 6" and 8" pumping units and pay big fuel bills when you can use this efficient 4" pump, tailor-made for the job? Economical to operate and maintain . . . easy to move around.



MODEL 646

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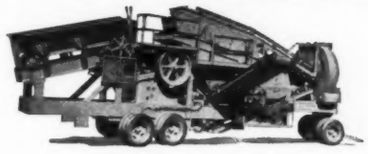

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- Only one power unit to service
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- 20% greater screening efficiency
- Better quality finished aggregate
- Lower initial cost — lower maintenance cost
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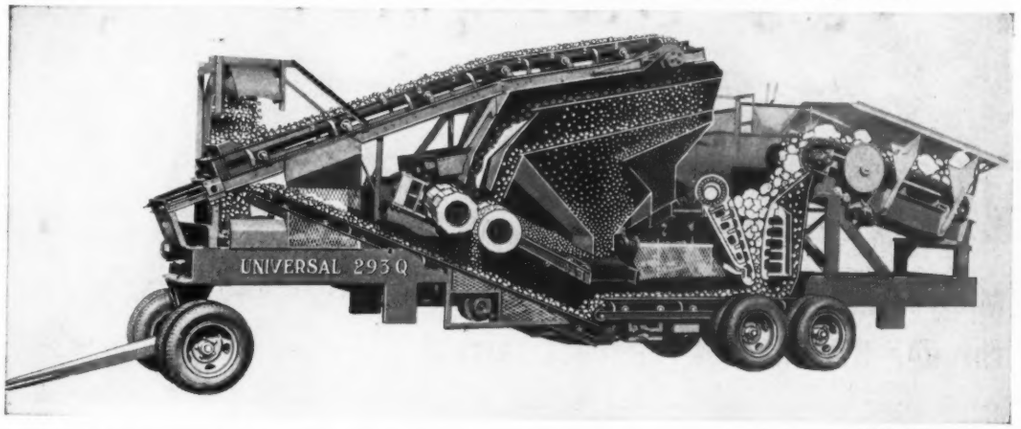
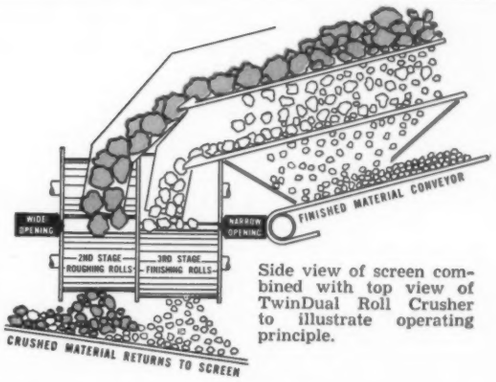
Jaw crusher and Apron feeder are mounted on separate skid frame to meet highway weight limits.



PIT OR QUARRY — rock or gravel. Name your operation. The TwinDual Pacemaker sets new standards for profitable hour after hour tonnage at low cost per ton. Three crushing operations with Universal's exclusive TwinDual Method provide top capacity, divide the load between three crushing stages. Permit a more favorable ratio of reduction resulting in longer crusher life, less maintenance and better quality finished product.

There is much more to the profitable TwinDual Story. Facts are yours for the asking. Bulletins U520 and U501 will give you detailed information.



Side view of screen combined with top view of TwinDual Roll Crusher to illustrate operating principle.

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■ Two sizes of air-operated machines for underground core drilling or blast-hole drilling are described in literature from Sprague & Henwood, Inc., 221 W. Olive, Scranton 2, Pa. The rod-pulling apparatus, with air-actuated piston, is described for each machine. The booklet also summarizes the company's line of diamond bits and other accessory equipment for diamond core drilling of any kind.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 81.

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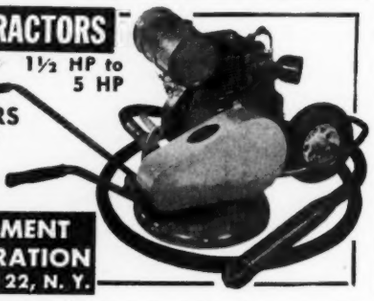

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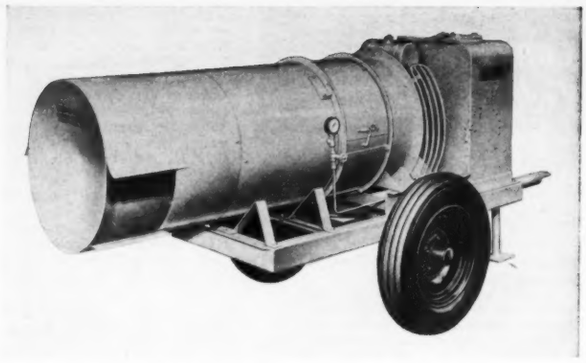


The Bes-D-Frostr, a blower-type heater that delivers up to 4 million Btu per hour, can be used in close quarters because its flame is shielded. It is moved from place to place by one man.

Blower-Type Heater

■ A large mobile heater for drying and curing concrete, cement, plaster, masonry, and paint is available from the Besler Corp., Emeryville, Oakland, Calif. It is also suitable for drying operations on highways, concrete ditches, culverts, and foundation work.

The Bes-D-Frostr is a blower-type heater with axial fan powered by a gasoline engine or an electric motor. The unit lights instantly, requires no preheating, and can be used in close quarters because the flame is shielded. It is capable of producing 1,000,000 to 4,000,000 Btu per hour.

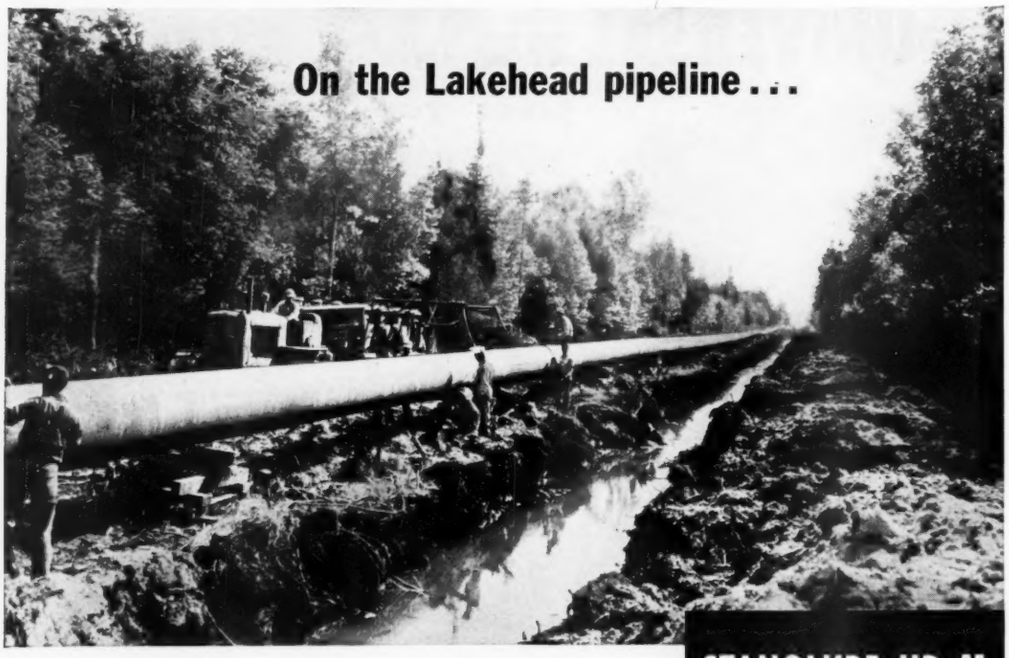
Employing low-cost fuel, the odorless, fumeless, clean operation of the heater makes it safe for use in confined places, with no flue required, according to the manufacturer. It is easily maneuvered from place to place by one man. The unit can be towed by car or truck between jobs.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 45.

Job Stories on Scrapers

■ Job stories on the Model C Tournapull are assembled in booklet form in the new LeTourneau-Westinghouse reprint book No. 6. It consists of reprints of job stories on Tournapull operations in North Carolina, Alabama, Delaware, Ohio, Minnesota, Illinois, Kansas, Texas, Oregon, California, and Washington. Data on haul length, load time, and cycle time accompanies the illustrations.

To obtain this literature write to the Advertising Department, LeTourneau-Westinghouse Co., 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 46.



Midwestern Constructors Inc., slash through 97 miles of roughest terrain

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Midwestern Constructors Inc., contractors for this roughest part of the 635 mile Lakehead Pipeline, between Superior, Wisconsin and Sarnia, Ontario, have this to say about the Standard on-the-spot service: "We gave our equipment a beating but it came through with flying colors because, as hard as we treated it, sound lubrication service and products kept it on the job."

Your nearby Standard Oil office and warehouse stocks STANOLUBE HD-M and a complete line of Standard quality fuels and lubricants, for fast local delivery. Here too is headquarters for your Standard Automotive Engineer. Call him today. Or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANOLUBE HD-M

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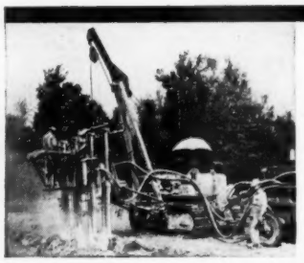
Motor Oil



STANOLUBE HD-M, Standard Oil's new and better heavy-duty motor oil, combines more effective detergent-dispersant action with greater oxidation stability . . . keeps deposits and wear at a minimum in all types of engines under the toughest operating conditions. Put STANOLUBE HD-M to work for you.

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STANDARD (Indiana)

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WARREN-KNIGHT

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The Willock swiveling frame keeps all wheels of the truck on the ground over rough terrain. Front and rear truck sections move independently to follow the ground contour.

Swivel Frame Improves Off-Highway Traction

■ A swivel frame that acts as a joint so that the front portion of a truck can move independently of the rear has been developed by the Willock Truck Equipment Co., Ltd., 205 W. 2nd Ave., Vancouver 10, B. C., Canada. This makes it possible for all of the truck's wheels to stay in contact with the tractive surface even when the vehicle travels over very rough terrain. A further benefit is that the normal frame twisting and bending under these conditions is eliminated. Axle troubles should be cut since wheel spinning and uneven load distribution is not present.

The swivel frame is a simple male and female coupling surrounding the driveshaft. The side members of the truck's frame are cut immediately behind the cab and joined again with a center-mounted tubular coupling fixed to the cab and the body halves of the frame. The rear, or male, tubular section fits into and revolves within the tubular front section through a thrust plate. The company states that the tubular coupling is stronger than the combined strength of the original side members.

For further information write to the company, or use the Request Card at page 18. Circle No. 168.

Gorman-Rupp Appoints

Two appointments have been announced by the Gorman-Rupp Co., Mansfield, Ohio, manufacturer of pumps. Named as district representative for the midwestern states is William S. Miller. George W. Erbe has been appointed district representative for the south-central states, with headquarters in Houston, Texas.

Line of Motor Graders

■ A new folder shows the three sizes of motor graders manufactured by Caterpillar Tractor Co., Peoria, Ill. The Caterpillar motor graders are illustrated doing contour terracing, ditching and casting, bulldozing and blading for grade construction, spreading windrows of oil and aggregate, removing snow from airfields, and bank-cutting.

The three motor graders are the 100-hp No. 12, the 75-hp No. 112, and the 50-hp No. 212.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 38.

"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete buildings, bridges, dams, walls and many other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.

4665-4669 Spring Grove Avenue — Cincinnati 32, Ohio

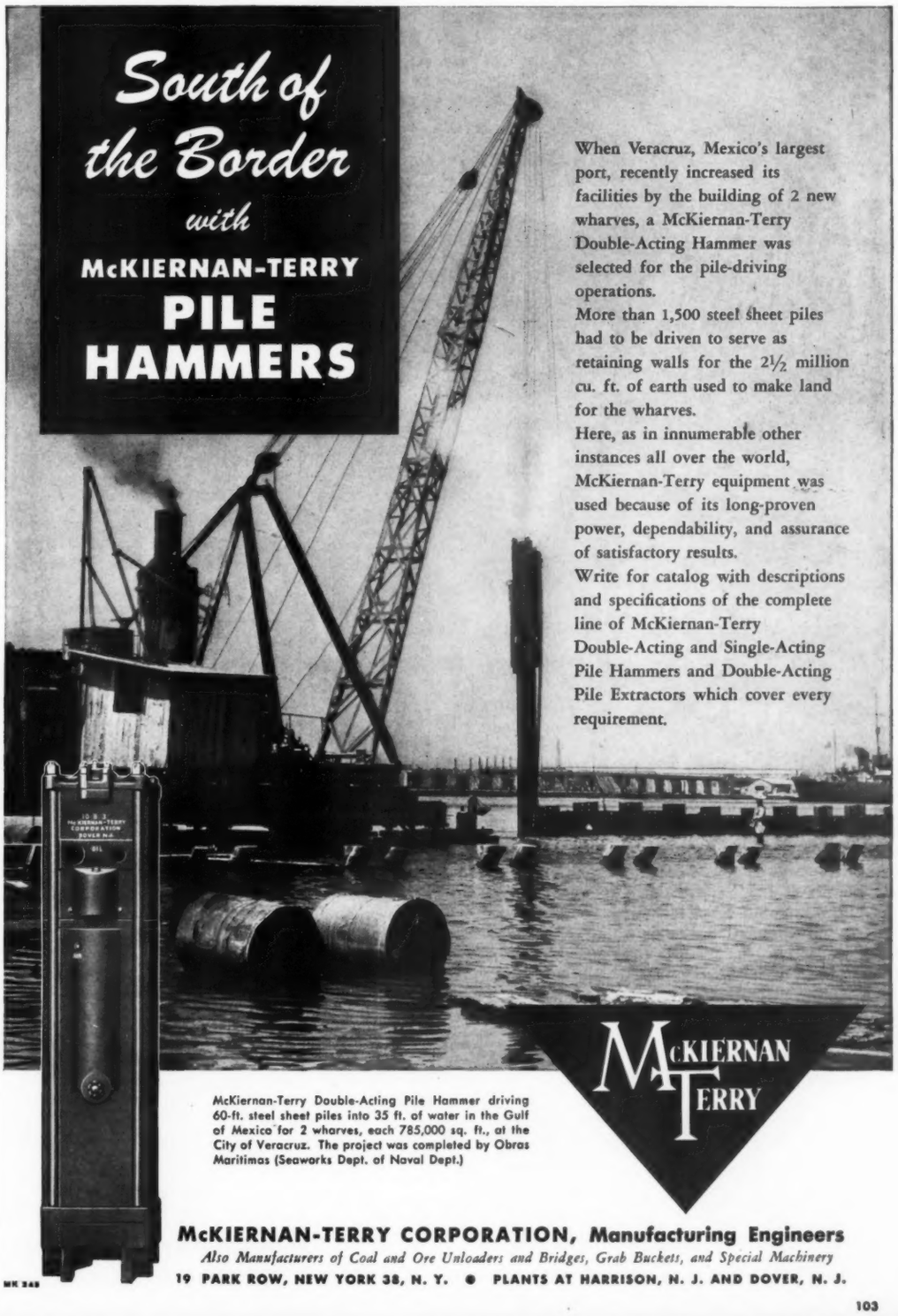
South of the Border with McKIERNAN-TERRY PILE HAMMERS

When Veracruz, Mexico's largest port, recently increased its facilities by the building of 2 new wharves, a McKiernan-Terry Double-Acting Hammer was selected for the pile-driving operations.

More than 1,500 steel sheet piles had to be driven to serve as retaining walls for the 2½ million cu. ft. of earth used to make land for the wharves.

Here, as in innumerable other instances all over the world, McKiernan-Terry equipment was used because of its long-proven power, dependability, and assurance of satisfactory results.

Write for catalog with descriptions and specifications of the complete line of McKiernan-Terry Double-Acting and Single-Acting Pile Hammers and Double-Acting Pile Extractors which cover every requirement.



McKiernan-Terry Double-Acting Pile Hammer driving 60-ft. steel sheet piles into 35 ft. of water in the Gulf of Mexico for 2 wharves, each 785,000 sq. ft., at the City of Veracruz. The project was completed by Obras Maritimas (Seaworks Dept. of Naval Dept.)

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION, Manufacturing Engineers

Also Manufacturers of Coal and Ore Unloaders and Bridges, Grab Buckets, and Special Machinery

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Messenger Vibrators

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Crushed Slag Is Used in Air-Base Pavement

A Vibro-Tamper compacts the stabilized subbase. In the foreground is the slag which forms part of the macadam base course.
C&E Staff Photo

Serves in both the macadam base and bituminous wearing course of new apron and taxiways at Dover, Del., field

USING CRUSHED SLAG in both the macadam base and the blacktop surface, the Corps of Engineers has just completed a 5,000-foot aircraft parking apron and adjoining taxiways at Dover Air Force Base, Dover, Del.

The $2,450,000 job was awarded to the Williams Construction Co., Baltimore, Md., late in 1952. Wet weather prevented full scale operations until late spring. Williams first moved in with several pavement breakers and removed nearly 60,000 square yards of old concrete taxiway, 6,000 square yards of blacktop runway, and 16,000 yards of surface-treated roads.

At the same time, a huge fleet of earth-moving equipment was brought in to work around the clock moving more than 350,000 cubic yards of excavation. Ten Caterpillar scrapers with both crawler and rubber-tired tractors, plus a Euclid loader with eight wagons, did all of the heavy grading. Production averaged about 1,000 yards per hour.

The 500-foot-wide apron was crowned along the center-line with sides sloping 1.5 per cent. A parallel taxiway is 75 feet wide, separated from the apron by a 175-foot-wide unpaved strip.

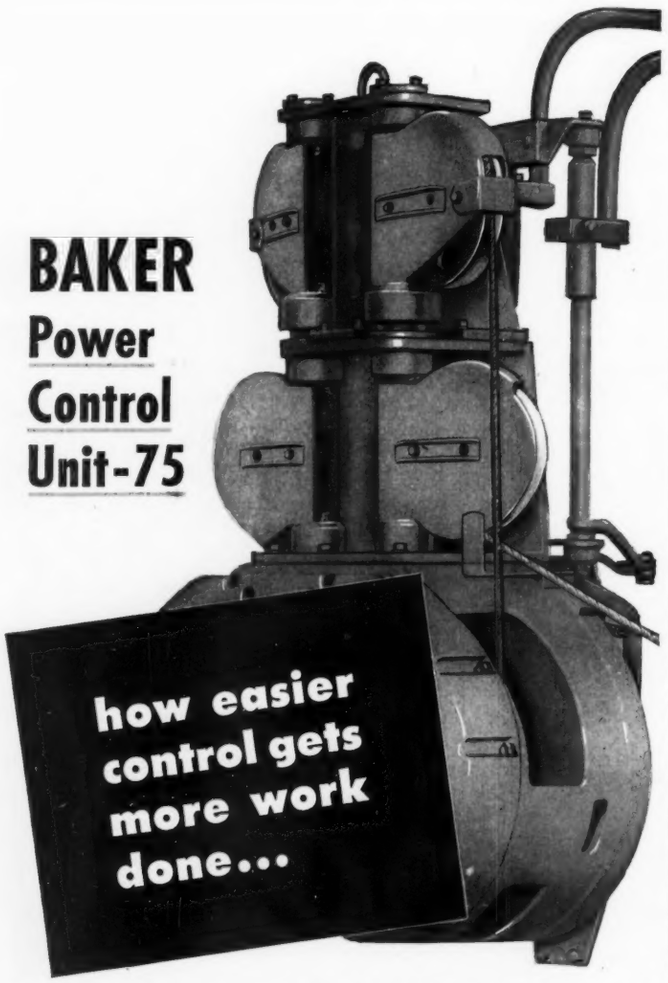
As the grading work neared completion, Williams purchased a tract of land near the base which contained the required 500,000 cubic yards of gravel for the subbase. A Northwest 4-yard and two 2½-yard draglines were put to work loading 14 Euclid bottom-dump wagons which hauled nearly a mile to the apron. The material was spread in 6-inch lifts and compacted with sheepsfoot and rubber-tire rollers.

Five tank-trucks sprinkled water on the material to assist in achieving the 100 per cent compaction. In cuts, a 42-inch course of gravelly sand was laid; in fills, a 52-inch course was used. These thick courses were required to sustain landing gear loads of 100,000 pounds on each dual wheel assembly and tire pressures of 200 psi. During the summer, crews worked around the clock, averaging 14,000 cubic yards a day.

Macadam

Before the 6-inch course of dry-bound slag macadam was laid, the surface of the sand subbase was covered with 2 inches of slag and mixed by graders. This stabilized the surface enough to prevent the tires of the heavy trucks from forming ruts.

Crushed slag for the 336,000 square yards of macadam was shipped by rail from Baltimore to Dover, where it was loaded into a fleet of trucks and trailers. Ten trucks hauled the



Field tests *prove* it: every feature of the new Baker PCU-75 is designed for *easier* control that *boosts operator efficiency*. A new multiple disc clutch minimizes lever travel to *only 5"*. New 3-way hand levers—adjustable for length, angular position, height—respond to *lighter* pressure. New simplified brakes are *faster* on-and-off. Result is *easier, more accurate* control that gets *more work done. See* the new PCU-75—designed for your Allis-Chalmers HD-15, HD-20 or any tractor of comparable hp and speed—*at your Baker, Allis-Chalmers dealer!*

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Of Course IT'S AN OMAHA DRAGLINE BUCKET

DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

Mounted on the dozer arms of a Caterpillar D8, a Jersey spreader lays down a truck load of slag. The spreader handled a total of 116,000 tons of material. *C&E Staff Photo*

Slag dust is put on with a Buckeye spreader. After rolling and checking, the macadam will get a bituminous prime coat in preparation for the blacktop wearing course. *C&E Staff Photo*

stone, and five hauled dust. All of the 116,000 tons of stone were spread by a Jersey spreader mounted on the dozer arms of a Caterpillar D8 tractor. Vibro-Tampers and Buffalo-Springfield 10-ton rollers did the compacting.

Slag dust was applied on top of the stone with a Buckeye spreader, and the macadam was rolled and checked with a 50-ton rubber-tire compactor. After the rolling had been completed, a bituminous prime coat was applied at the rate of 0.4 gallon per square yard.

Black-Top

Bituminous Construction Co., of Baltimore, Md., subcontractor on the blacktop work, set up a Barber-Greene continuous-mix plant in a field near the base. The job called for 45,000 tons of 2½-inch binder course and 27,000 tons of 1½-inch surface course.

Stockpiles containing minus 1-inch slag, minus ½-inch slag, sand, and screenings were built up over a 100-foot-long corrugated metal reclaiming tunnel. The aggregates were automatically fed onto a conveyor in the tunnel by Syntron feeders. A bucket elevator picked up the materials at the end of the conveyor and carried them to the dryer. From there, the heated mixture moved through the plant to the volumetric proportioning gates, the pugmill, and then the hopper.

Esso asphalt was stored in a 20,000-gallon tank jacketed with steam coils and insulated. Steam was supplied by a 150-hp oil-fired boiler. Fuel oil for the boiler and the dryer was stored in a 10,000-gallon tank. Power for operating the plant was generated by a Caterpillar D315 diesel-electric set.

The 2½-inch-thick binder course required 36 per cent sand, 24 per cent screenings, 20 per cent minus 1-inch slag, and 20 per cent minus ½-inch slag. The 100-120 penetration asphalt was added at the rate of six per cent.

Trucks hauled the bituminous concrete to the apron where it was spread by two Barber-Greene finishers working together. Four Buffalo-Springfield 10-ton rollers followed behind. Production averaged 850 tons per 10-hour day. After a tack coat had been applied, the 1½-inch surface course was laid.

Personnel

Charles Taylor was superintendent for the Williams Construction Co. J. P. Certa was resident engineer for the Philadelphia District of the Corps of Engineers, U. S. Army.

THE END

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HARTFORD 15, CONNECTICUT

A Riverside road is bladed by this Austin-Western 99-M motor grader, working on one of the county's many betterment jobs.
Ray Day Photos

Maintenance Program Counters Heavy Traffic

County finds an efficient low-cost road program is vital in coping with daily average of a million vehicle miles

WITHIN THE PAST DECADE or so, southern California's Riverside County has taken on a new look. Formerly a place of small cities and huge orange groves, it is now an area in which the population has skyrocketed, in which defense bases and airfields have mushroomed, and in which new industries have settled. One of the consequences of this rapid urbanization has been that the county highway system is being pounded at the staggering rate of a million vehicle miles per day.

This mounting traffic is being met by a program of mechanized low-cost maintenance, augmented with much new road construction. Programmed for the current fiscal year alone are 124 highway jobs which, together with routine maintenance, will cost $1,928,844. This ambitious schedule includes 11.92 miles of gravel surfacing far out in the desert, 56.27 miles of bituminous paving of various types, and 65.57 miles of seal-coating on the 2,715-mile county highway system.

Maintenance on the Riverside County highway system is some of the best now being done in southern California. When the Federal Aid Secondary Program was authorized shortly after the close of World War II, the county was the first to complete a section under the setup. Since that time, 15 similar projects covering 114 miles of road have been built.

Diversified Problem

The county's highway maintenance is far too diversified to be cataloged. Riverside, despite the fact that its land area is slightly smaller than that of San Bernardino, its neighbor county of 24,000 square miles, has many problems. Like San Bernardino, Riverside reaches almost from the Los Angeles metropolitan city limits to the Arizona state line at the Colorado River. In this vast area are thousands of acres of agricultural land, citrus crops, high mountains in which winter snowfalls create problems, and semi-metropolitan areas like the county seat at Riverside.

The county has always had a good road system, however. As far back as 1880, individuals and land-development companies left space for at least three modern 4-lane divided, limited-access expressways which have since been built. A 1913 vote approved the allocation of $1,300,000 in road-building bonds. Gradually, a good network of roads on unusually permanent alignment developed. Later, after the passage of the Collier-Burns Highway Act of 1947, the present highly skilled engineering organization evolved. The act, which established a Board of Supervisors as a road commission for each county in California, also required the commissioners to appoint a registered civil engineer as a highway commissioner.

If the present county highway program were not pitched on engineering know-how and good organization, today's problems would be even more difficult. More and more

Styles illustrated
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51-05 Pants
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This Littleford Mechanically Operated No-Drip Full Circulating Spray Bar has "Built-in Engineering" for Spraying Perfection.

Equipment bearing this seal is assurance that it has been Engineered to do the job for which it was intended.

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people, accustomed to better transportation facilities, are demanding a higher type of maintenance program. Ten years ago, a hole in a blacktop pavement could remain unrepaired for several days without causing much of a stir, while today it is not unusual for a dozen telephone calls and letters to come into the county courthouse requesting action on a road hole 8 inches wide and perhaps 1½ inches deep.

This situation has made it imperative that the county develop a well-programmed low-cost maintenance plan. Excluding the engineering force, Riverside County has a roster of 165 maintenance and construction people working the busy well-kept equipment.

Since the county has no road tax, construction and maintenance funds come from gasoline and motor vehicle registration taxes which are allotted to the county from the state. The county also resorts to other means to stretch its road dollar. One of these requires property owners to contribute from half to a third of the cost of paving residential streets, the exact levy on each property owner being based on frontage ratios or other yardsticks. Despite this, the county is still forced to wage the usual economic battle for construction and maintenance funds familiar to all highway engineers.

Aside from the economic question, Riverside County's program involves the problem of covering a huge geographical area. This requires mobility and mechanization.

All specialized work, such as bridge construction and the relocation of utilities and pipelines, is usually let out by contract. But Riverside has found that the best way to meet its particular problems is to keep the control of maintenance activities in the hands of county maintenance men who operate their own equipment. As much of the work as possible is done by county crews and equipment under the centralized supervision of A. C. Keith, county surveyor and road commissioner.

Organization

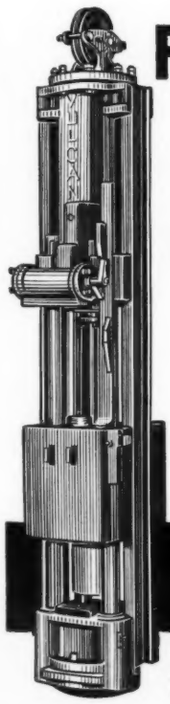
The Riverside County highway organization, centered in the county seat of Riverside, is divided into two principal activities, construction and maintenance. Keith directs the program under the general supervision of the board of supervisors.

B. D. Powell, assistant road commissioner, is responsible for all road department engineering. Assisting him are two construction engineers, a civil engineering associate, three civil engineering assistants, a draftsman, and an engineering aide. Other personnel in the office divide their time between general county and road engineering.

Road construction and maintenance is under the general supervision of R. L. McKenzie, assistant road commissioner. With him in this part of the program are 12 district foremen, 6 subforemen, a road-construction foreman, and a pavement-construction foreman. The district road foremen are located in permanent residences at strategic points.

(Continued on next page)

Decomposed granite, which will strengthen a subbase on one of the county's roads, is removed from a pit by a Bucyrus-Erie 22-B shovel and a fleet of dump trucks.



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SINGLE-ACTING STEAM
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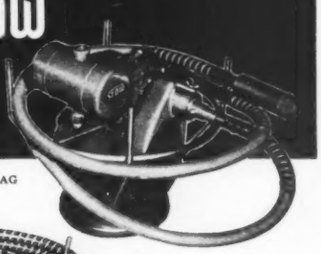
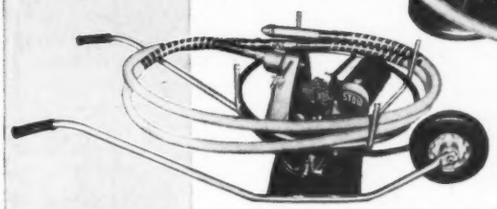
New performance features built into STOW CONCRETE VIBRATORS



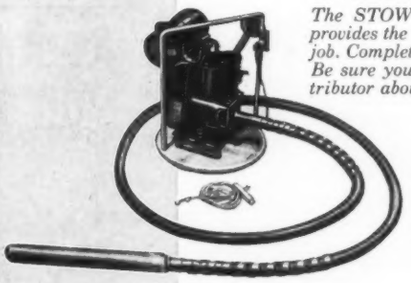
MODEL AG



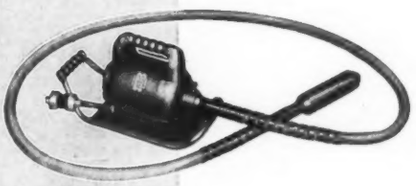
SHOWN: MODEL BGW. This is the standard STOW model BG vibrator, mounted on wheelbarrow for easy maneuverability. Model BG & BGW feature 2 HP 4 cycle, air-cooled engine; ball-bearing eccentric belt tensioner.

Contractors like STOW vibrators because the high operating speeds of this new STOW vibrator line make possible the use of heavy duty, light weight flexible shafting, and lighter, more efficient vibrator heads. And STOW design provides convenient speed control so that attachments for rubbing, grinding, cleaning may be used directly on the vibrator shafts, making it unnecessary to purchase extra shafts for this purpose.

The STOW line is complete . . . provides the right vibrator for every job. Complete accessories available. Be sure you see your STOW distributor about the STOW line!



MODEL J—The lowest priced vibrator in the STOW line. Slower speed means longer, trouble-free operation. Model J features 3600 (max.) VPM, 2 HP 4 cycle air-cooled engine, and direct drive.



MODEL BU—Features 2 HP at 9000 VPM, operates on 115 volts AC or DC with splash-proof, high speed ball-bearing motor.

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STOW MANUFACTURING CO.
40 Shear Street, Binghamton, N. Y.

An Adams motor grader moves down the nearly finished grade line of decomposed granite subbase on a Riverside highway, blading the material to neat lines.

(Continued from preceding page)

Each maintenance foreman has a small headquarters yard with space for materials and equipment storage. These crews are fully mechanized, and each foreman's needs in the way of trucks, motor graders, pullgraders, tractors, skip loaders, asphalt patch kettles, and small tools are filled.

Two heavy-construction gangs, totaling about 50 men, are included in the county organization. These crews are regularly assigned to major betterment projects such as grade changes, relocations, and subbase betterment. Both cover the county under a systematic program. During the first part of each construction season, the men work in the western section of the county, near Riverside. In the fall, they move to the Thermal and Blythe areas to improve the roads in the Coachella and Palo Verde valleys. For the temporary convenience of the men, dormitories and mess halls are located at Thermal and Blythe. Most of the men on these crews are married and dependable, and many have been with the county for 15 or more years.

Having these construction crews on the payroll does not provoke a clash with the contract system of work. Since there is never enough money to cover Riverside's ambitious schedule, compromises must be made by doing some jobs piecemeal. County crews are geared to do this type of work most effectively. A typical large job which must, because of economies, be spread out over a period of time is a new realignment of seven miles of the Lambs Canyon between Beaumont and San Jacinto. Excavation on this project alone will run to $150,000. Since there is never enough money in reserve for a program of this type, heavy-construction crews will do the job in off seasons, completing a few thousand dollars' worth of work as money for the job becomes available. The new road will be finished within a few years. Keith is not one to say that final costs on this job will be lower than if it were done under the contract system, but he holds that costs will not be excessive and that this type of program is more convenient economically.

Low-Cost Asphalt Repairs

One of the major activities in the county public-works program is the continuous task of maintaining bituminous highways on the 2,715-mile system. Of this total, 583 miles is heavily traveled pavement, and about 2,132 miles are classified as secondary roads, even though many of them carry traffic of well over 300 cars a day.

Riverside County was one of the first in California to adopt the bituminous road-mix method of construction on these roads, which has been kept fairly constant over the past decade and a half. The mineral filler for the road-mix, along with subbase material, is imported from decomposed-granite pits scattered over the county. This material is mixed out by motor graders or by three Gardner mixers owned by the county. Then from 3½ to 6 per cent of SC-3 or SC-4 asphalt is mixed with the mineral aggregate to make the oil cake. All-rubber rolling is the usual practice on this type of work.

It is an engineering policy of the county to seal-coat all road-mixed roads about once every five years. This is done by crews using high-viscosity asphalt emulsion, stone chips, and paving equipment. Spot patching with premixed bituminous material is done, whenever necessary, between the sealcoat jobs.

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QUICK ACTING UNIVERSAL
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Heads are locked by pressing together and giving quarter-turn. These locking heads are identical for all sizes of hose or threaded ends, permitting the coupling of any two sizes of hose, or hose and pipe, within the "AIR KING" size range. Equipped with patented safety locking device. Bronze or rustproofed malleable iron, in sizes up to 1".

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WILL DO MORE JOBS BETTER THAN ANY OTHER LOADER
There's no time out for this work horse. Convenient attachments give it year 'round useability. Exclusive features such as 12-minute attachment, box frame construction oil filter, adjustable arms that keep bucket in correct position with ground and others make it your best buy.

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Powerful post driver can be operated by one man. Drives 10' high to 5' below ground.

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Leaves, snow, dirt, and trash are easily cleared and loaded with either material or utility bucket.

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Dozer has 62" blade. Skid shoe extends full length. Permits hydraulic control of bite.

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STANDARDIZE ON NEW—NON-MELTING
PLASTILUBE
MADE BY WARREN
EST. 1901

Another of the maintenance crews' main jobs is the periodic widening and resurfacing of the old oil cake to new standards. Each year, many old 18-foot side roadways are widened to 22 and 24-foot widths to make driving more safe. Grading equipment builds the subgrade, and other equipment strengthens the base. If necessary, the old oil cake is broken up by motor graders with scarifier equipment and several Hyster grid rollers. The material is then windrowed, and new asphalt, delivered from refineries in the Los Angeles area, is laid.

Keith and his men like this method since the Gardner mixer permits a crew to get its oil in a windrow in short order and releases the transport truck quickly for another load. The county maintains no asphalt heating or transfer points, thus saving money by hauling the hot oil directly to the point of use. Crews apply SC oil at a rate just slightly higher than the material in the filler indicates should be used. After the first completed mixout by the Gardner machine, motor graders have plenty of time during the aeration blading to pick up just enough dry-base material to make a perfect job.

Maintenance varies on other roads. The county has little portland-cement concrete, but plant-mixed asphaltic-concrete roads are beginning to appear. There are also some gravel roads in the county, although mileage on this type of road is on the wane. Perhaps one of the worst maintenance problems is that of drainage because of its relation to durability. Changing gravel or dirt streets to road-mix cakes with curbs and gutters always demands careful drainage engineering on the part of the department.

In difficult soil conditions, the county also maintains a well equipped laboratory which does analysis and makes recommendations concerning construction or maintenance procedures. The lab is fully equipped to make CBR's, conventional soil studies like PI's, Liquid Limits, and sheer strength, along with asphalt tests.

For the current year, the budget breakdown shows the relationship between the county's maintenance and construction work:

Engineering and administrative	97,583.23
Construction of bridges and viaducts	25,815.72
Construction of primary roads	570,235.94
Construction of secondary roads	453,884.49
Maintenance of bridges	362.83
Maintenance of primary roads	181,540.98
Maintenance of secondary roads	425,295.38
Right-of-way acquisition	39,469.52
Purchase of new equipment	81,327.89
Purchase of materials	47,548.39
Crossing guards	5,779.59

Business Machine Report System

Reports and cost-keeping activities of the county's maintenance and construction program is done with automatic IBM business machines used by the road department.

Started in 1949, the system has been perfected to the point where many bookkeeping functions, formerly done by employees, are now done automatically. Riverside County has a centralized business-machine section handling a number of jobs, and it is so efficient and well equipped that it is able to handle the road department's work, completing the job in no more than three days a month. With information supplied from foremen's daily reports, the business machines can compute unit costs, give a detailed breakdown of labor items, and keep track of equipment costs and fuel.

Cost charges have been simplified so that field men are able to

(Concluded on next page)

In the centralized business machine section, the road department's bookkeeping requirements are handled in less than three days each month by the IBM system.

DRILLING CONTRACTORS

Diamond and Shot Core Borings, Dry Sample Borings, Grout Holes and Pressure Grouting, Foundation Testing for Bridges, Dams and all Heavy Structures

Manufacturers, also, of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits.

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Dept. C, Scranton 2, Pa.

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Yes, here's a sump pump that all you do is bury it . . . forget it . . . and run it for days. A dry sump cannot hurt this pump. For pumping more liquids . . . faster . . . higher . . . cheaper . . . use an Ingersoll-Rand Air Operated Sump Pump.

These pumps are powered by Ingersoll-Rand "Multi-Vane" air motors which have an unequaled reputation for reliability. Put these dependable sump pumps to work for you earning extra profits. They will pump as much as 250 gallons per minute and will handle heads up to 200 feet.

This Ingersoll-Rand centrifugal type sump pump is the cheapest way to move water, oil, sewage or medium sludge. It's air operated for economy. No need for a standby operator. It consumes a minimum of air. On heads of more than 40 feet air consumption is as much as 30% less than comparable units.

Write today for complete money saving information on this remarkable sump pump.

Size 25 Sump Pump.

Size 35 High Head Sump Pump.

The I-R air operated sump pump is available in Sizes 25 or 35. Both types are lightweight for easy carrying by one man. They use dirt-and-liquid-protected bearings for the impeller and motor rotor. All parts are made of bronze, stainless steel, or rust-proofed steel. The Size 25 can also be supplied with an all-bronze exterior when used in corrosive or inflammable liquids.

use the IR CONTRACTORS' COMBINATION

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(Continued from preceding page)

cooperate with the business-machine section. Their reports are now based on a system of codes which works perfectly. Among the codes for construction work are CRW, standing for clearing right-of-way, moving fences, trees, and obstructions; EE, excavation and embankment; CDS, culvert and drainage structures; BRC, bridges; IM, import materials, graveling; PV, pavement construction; SUC, supervision and engineering; MEC, moving equipment; and SC, seal-coating. The code for maintenance work includes RS, roadsides, drainage, weed control, ditches, and tree trimming; PAT, patching; GR, grading; TR, traffic control; SUM, supervision, engineering; MEM, moving equipment; BLG, building; HYD, holiday; SP, stockpile; and MTC, maintenance at yard.

In addition to simplifying the road department's bookkeeping, the IBM system has speeded the breakdown of statistics concerning construction and maintenance costs. Keith knows, for example, that average seal-coating costs for 22-foot roads are $900 per mile, and a foreman on such a job cannot depart very much from that figure.

Sufficiency Rating System

To determine the proper priority of maintenance and construction, the county has also developed its own sufficiency-rating system combining the best features of a number of methods including, among others, the Bureau of Public Roads method, the State of Oregon Solvency Quotient method, the Arizona Sufficiency Rating System, the Automotive Safety Foundation Deficiency Rating method, and the Numerical Classification Plan of Hartford County, Maryland.

The system divides considerations among service, safety, engineering, and economic factors, and the Riverside adaptation is beginning to work well.

Equipment Repair Pooled

The garage taking care of all county equipment is in charge of the repair and upkeep of Riverside's big equipment fleet. Work on road-department equipment represents about 70 per cent of the total work done by the garage. To insure the return of road-department machines to the job in fast time, they are given highest priority at the garage.

Smaller repairs to equipment in the subyards are made at those sites. All major repairs, however, are done at the Riverside shop.

Apart from keeping in step with the current traffic volume in the county, Riverside's current program with its mechanized operations, and systems of equipment repair and cost records, is permitting crews to be trained and data to be gathered which will be of inestimable value in the years ahead. THE END

Osgood-General Appoints

Osgood-General, Marion, Ohio, manufacturer of power cranes, excavators, and material-handling machinery, has named William H. McAllister division sales manager for Texas, Oklahoma, Kansas, and western Missouri. Mr. McAllister will make his headquarters at 3771 Almazan Drive, Dallas, Texas.

A Model 12-A Fuller torque converter coupling is used on this Load Plus Jaeger loader.

Machines Are Equipped With Torque Converter

■ Adoption of a Fuller torque converter coupling as the power transmission link in a number of industrial machines is reported in a progress summary just issued by the Fuller Mfg. Co., Kalamazoo, Mich. Among the equipment using the Fuller converter drive are delivery trucks, front-end loaders, tow trucks, mobile cranes, and hoists.

Designed for use with engines developing from 180 to 225 pound-feet of torque in the 2,000-2,200 rpm range or higher, the torque converter coupling delivers up to 2.1:1 torque multiplication with automatic adjustment to 1:1 coupling operation as torque demand drops.

The torque converter is particularly recommended wherever starting and stopping are frequent, or heavy load pickups overwork engines, gears, drive lines, axles, tires, and operators. The Model 12-A unit is equipped with an SAE No. 3 flywheel housing at the output end for attachment of conventional transmission. Model 12-S is equipped with a splined output shaft.

For further information write to the company, or use the Request Card at page 18. Circle No. 27.

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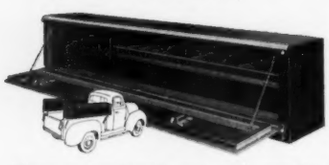

These easy-to-install tool and material compartments are finished in baked-on, medium-dark green enamel. Parts bins are built-in. Doors have slam-action catches, with locks keyed alike. Available with overhead rack.

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Single line cap. 300# @ 100 feet per minute.

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The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

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NOW... better joint maintenance at less cost!

✓ FAST
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✓ DEPENDABLE

CUTTERS are easily spaced to clean joints from ⅜" to 2¼" wide or more. Very durable.

CLEANING irregular crack is easy as cutters follow winding fissure. No skill needed.

EXTRUDED MATERIAL shaves off instantly with 4" cutting head. Leaves smooth surface.

As proved by highway depts. in many states, a **Tennant Joint-Cleaning Machine** now makes *modern* joint resealing possible . . . so pavement joints can now have dependable year 'round protection. This means less cost-per-mile for annual maintenance . . . smoother joints . . . fewer heave-ups . . . longer pavement life.

SAVES TIME . . . ASSURES BETTER BOND

Powered by a 13½ h.p. engine and guided by one man, this machine's high speed cutter head whisks old seal out of joints or cracks . . . simultaneously cleans and roughens sidewalls to allow a good bond with new seal.

With one of these machines you're equipped for 8 different jobs in pavement maintenance . . . including leveling humps, cleaning irregular cracks, removing traffic lines, scoring surfaces to improve traction, etc.

Write today!
Get the facts about this machine . . . and how it has PAID FOR ITSELF ON A SINGLE JOB in some cases.

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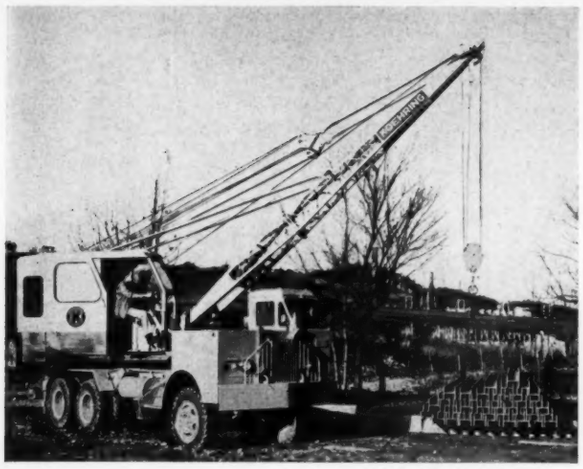

The Koehring Model 205 excavator-crane is now available with truck-mounting.

Truck-Mounted Model Of Excavator-Crane

■ Production of a truck-crane version of its recently improved Model 205 excavator has been announced by the Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis. The new unit, which will lift loads up to 15 tons as a crane, has a road travel speed of 32½ mph. Straight boom jibs, 15 to 30 feet long, are available for high-lift crane service. The new truck crane can also be adapted to clamshell, dragline, shovel, and hoe work. Power lowering and safety boom-limit stops are standard equipment.

The truck-mounted excavator has 10 forward speeds ranging upward from 2.03 mph. There are two reverse speeds, 4.08 and 2.04 mph. Power air brakes are built into each of the four double-tired drive wheels in the rear. The front steering wheels are single-tired. The truck cab is of the one-man type and has windows of safety glass.

The truck body is equipped with two outriggers for extra support during stationary lifting operations. These are provided with marker lights for night work. In keeping with modern highway driving practice, front and rear turn signals are built into the chassis as are standard driving lights.

For further information write to the company, or use the Request Card at page 18. Circle No. 12.

The Rochester Products Division of General Motors produces enough single and double wall steel tubing in a year to stretch across the country 24 times.

Petroleum Corp. Manager

Forrest G. Heath, the new assistant manager of the asphalt division of Mexican Petroleum Corp., a subsidiary of the American Oil Co., New York City, will make his headquarters in the executive offices of the organization in New York City.

Mr. Heath has been in asphalt sales work for the company in Raleigh, N. C., for approximately 24 years, and had been district asphalt sales manager for North and South Carolina preceding his present appointment.

Trailer-Mounted Floodlight Unit

NITE-HAWK

MAKE NIGHT HOURS PAY with NITE-HAWK

Four 80,000 c.p. flood lights raise to 8½ ft.—aim in all directions. Control panel has duplex receptacles for extension light and power tool lines — voltage regulator — circuit breaker — fused circuits.

Tows at highway speeds on heavy-duty trailer with leaf springs—retractable caster wheel. This is the finest, most flexible unit available. Also low-cost, dependable 500 watt to 20 k.w. gas-electric plants.

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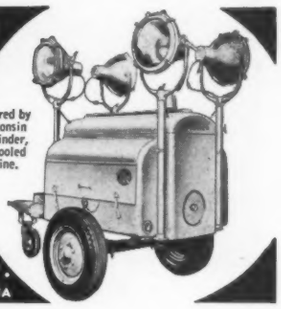

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Popular uses of Schramm smaller compressors include trench digging, backfill tamping, paint spraying and roofing material, operating paving breakers, 20 and 40# rock drills, concrete vibrators, saws, etc.

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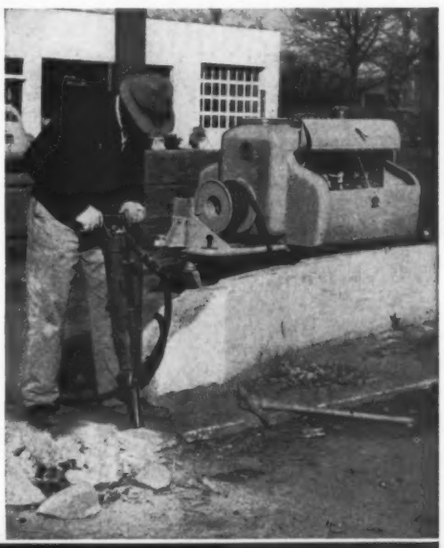

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Portrait in Print

R. H. Fulton: Big Time Pipeliner

By RAY DAY

Using his headquarters office as a base of operations, Fulton divides his time between visiting his jobs and checking up on prospective work for his company in various states.

NOT LONG AGO, as a community leader of Lubbock, Texas, sat talking over a civic program in the office of R. H. Fulton, president of R. H. Fulton & Co., the genial easy-going Texas pipeliner was frequently interrupted in his conversation to take long-distance telephone calls. The phone conversations were pointed, told of a hatful of headaches and, on Fulton's end at least, were mildly profane. Now and then, a department head came in with a problem to be solved. Despite these interruptions, Fulton handled the civic matter with his usual aplomb.

As the visitor turned to go, he said, "Mr. Fulton, you're one of America's big contractors, but I don't envy you. I wouldn't put up with all that noise for all the money on earth."

"Neither would I," Fulton grinned. "Not for money. I just happen to flat like it."

In Texas, this means a person is pretty much sold on what he's doing. Nothing could better express Fulton's love for the pipeline business than that simple phrase.

Beginning just 14 years ago with a pair of bulldozers, Fulton has seen the company grow while he reinvested profits in the organization and insisted on the kind of work a pipeliner's ethics seem to demand. Currently, the big Texan rides herd on seven major pipeline spreads scattered over a number of states. There is hardly a section of the country in which Fulton has not done a pipeline job. Last year, the company's pipeline volume ranked with the nation's biggest organizations in the field, H. C. Price Co., Inc., of Bartlesville, Okla., and Houston Contracting Co., of Houston, Texas. Next year, the company will lay some 1,400 miles of pipeline, mostly from 16 to 30 inches in diameter, and make 10 river crossings. Laid end to end, these lines would reach from New York to Omaha.

A typical Fulton spread employs from 200 to 300 men, has perhaps 100 pieces of heavy equipment and an operation cost of from $75,000 to $125,000 per week, including an average $40,000 weekly payroll. At regular intervals, the finest machines on this spread can be expected to break down. One week, the spread may be situated in a town where the men are happy. The next, it may be shifted to a small isolated community which the workmen do not like.

This typical spread's difficulties, arising from both mechanical and personnel problems, if multiplied seven times, give some idea of what Fulton calls the "meat and potatoes" end of his business.

Progress: The Golden Goal

In this business, as in any other, progress is a word which no one can afford to forget. Fulton doesn't forget it and he lets no one else forget it. With the enormous financial responsibility of seven spreads resting directly on his shoulders, he keeps in touch with all the work by means of long-distance telephone and his private plane, a twin-engine Beechcraft.

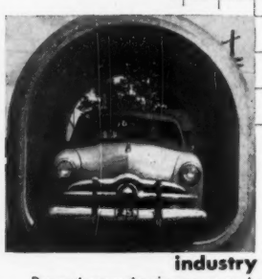
By 8:30 every morning, Fulton knows exactly the weather conditions and special problems on each spread, and how much footage was laid the day before. Altogether, he spends 100 hours a month flying to various construction jobs. It is safe to say that he knows every important detail about his business.

Fulton's brand of management is impressive. It could be seen in action when, one afternoon at about 5 o'clock—a time of day when spread superintendents can expect to get back to their field offices—Clark Williams, general superintendent, flew down to one of the company's far-flung pipeline spreads in southwestern Texas from Dodge City, Kans. Walking into the office, he picked up the phone and method-

flatten cost curves with UNIVERSAL Flat-base pipe

conduits

railroads



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Check these Features!

- STANDARDIZED PARTS. Ford, Timken, Vickers, Bendix, etc., assure highest quality components and low-cost servicing.
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- LOAdALL BUCKETS. Available with capacities of ⅜, ¾, ⅞, 1, 1¼ and 1½ yards.

A HIGHLY MANEUVERABLE POWER SHOVEL

Lessmann LOAdALL scoops up big loads of the most heavily compacted soils, cinders, aggregate, etc. . . . does it in 5 seconds while standing still! Extra hydraulic cylinders supply Hydraulic Power Crowd. This means *loading* with hydraulics which eliminates ramming and spinning of wheels . . . *minimizes repairs, reduces maintenance!* Dozer blade is easily attached for grading, backfilling. Crane-hook, lift forks, snow and trash buckets are also available.

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52″ REACH

Here's a full 4′4″ reach at maximum clearance! LOAdALL carries load close but quickly boosts it *'way out ahead* for easier loading . . . another advantage of Hydraulic Power Crowd.

HYDRAULIC POWER-CROWD

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Write for Complete Information TODAY!

In his Lubbock, Texas, office, R. H. Fulton, president of the company which bears his name, keeps in touch with one of his many pipeline spreads.

ically called every pipeline spread.

As he talked with each spread superintendent, Williams chewed his cigar. Depending on what he heard, he smiled, spoke sharply, or scowled. Knowing in detail every hill, rock pile, swamp, and the problems each superintendent might be facing, he was able to build up a picture of the day's progress by asking: "How'd it go today? . . . How many joints did you get? . . ."

It's hard to say whether Williams learned this particular brand of management from Fulton or whether Fulton picked up part of his drive from Williams, but at any rate, both demand a continual accounting from spread superintendents. In turn, no spread superintendent relinquishes the same type of pressure on his foremen.

According to Fulton, progress in the pipeline business is complex, involving the day-to-day solution of a host of unrelated problems. A typical day's operation on a spread represents a separate pipeline job covering anything from a dead loss to 10,000 feet of completed line. Problems may call for tact and diplomacy, as when the whole spread is moved to a small town which no one will like. Other problems may be concerned with crews fighting hard rock or crossing a swamp. A valve might be located in the wrong place, calling for consultation with the owner's representatives. Or perhaps the equipment is responsible for some snag.

No one is more ruthless than Fulton about equipment and its relation to progress. No item of equipment is ever tied directly to a depreciation sheet. Fulton keeps the best mechanics on his jobs, and the minute a piece of machinery costs too much for repairs, it is replaced. If a tractor goes sour in one year, off the job it comes. If it lasts eight years, it is kept working.

A spread which might be considered average will utilize 30 tractors, 7 power shovels in the ¾-yard class, 6 dope pots, a cleaning machine, a dope machine, 5,000 cfm of air compressor capacity, 20 wagon drills, 20 trucks, and innumerable items of smaller equipment.

Adherents of the school of thought which believes that all pipeliners—and particularly those in Texas—are rough and uncouth characters might be a little surprised if they heard an analysis of the pipeline business from Fulton, a representative of that rough-and-tumble business who collects rare books and editions of the world's finest literature as a hobby.

"Sure it's a rough business," admitted Fulton. "How could it be anything but rough? The average pipeliner moves around from place to place, hits good towns and bad ones, works seven days a week, and has plenty of trouble 12 hours a day on a job. If a man knocks his head against that set of circumstances for a period of years, he's bound to see a lot of things and solve a lot of problems.

"If he develops a certain roughness, he'll also develop self-reliance. Some of these 'rough' pipeline characters are the finest people on earth. Frankly, I look forward to the times I spend in the field when I can see

(Continued on next page)

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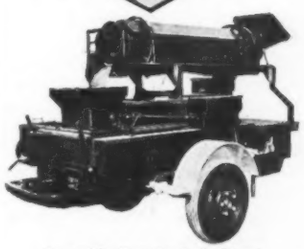

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(Continued from preceding page)

these boys and talk with them. They may be rolling stones who gather no moss, but they've acquired good polish in the process.

"Beyond this trait of roughness, you won't find anything but good in the pipeline business," Fulton declares. "It's a lot different from general contracting or any other kind of business. But I know for sure there must be easier ways of making money.

"It's a specialized business," Fulton said. "The gas and oil companies are in business to make money for their stockholders. When they get authorization to build a pipeline from the Federal Power Commission, they go about it in a different way from the average state or federal contracting agency. They're invariably in a big hurry, and no matter how much progress we can make, it makes them happier if we can hurry the job along.

"One of the unique things about pipelining is that most of the bidding is by invitation only. And the only way to be invited to bid is by demonstrating professional competence so that companies can trust your firm. I can't think of any other form of contracting which calls for more faith among men. And I might add that it works in two ways: we have just as much faith, trust, and friendship for the gas companies as they have for us. The only way to merit that trust is to do a good job, equip your job right, and make good progress.

"Sometimes," Fulton added, "doing good work will clash with the progress we've got to make. We've got to keep both on a high level to make the normal, reasonable profit we try for on every job. The expense of operating a spread is . . . well, you figure it out for yourself.

"Once in a while," he said, "you'll hear the boys crab about the headaches involved in keeping a good balance between progress and pipeline volume, but when the job is done, the tough river crossings in, and the highest mountains crossed, and they get together for a few drinks, you'll hear them say, 'We strung 'er!' That's what makes you proud of the business. Deep down, those boys really like a challenge. It's one of the things that makes pipelining the most fascinating contracting business on earth."

Business Just Grew

Fulton's interest in pipelining had its beginning when he landed a job as timekeeper on an oilfield pipeline outfit at the age of 21. He eventually worked up through the jobs of paymaster and office manager. Working with costs and production figures, he found more and more that he wanted to get into the business for himself. He took the big plunge in 1940. Purchasing a pair of tractors and dozers, he began picking up small jobs at Slaughter Field, near Lubbock. He worked on oil-well cellars, small pipelines, and all the tough little assignments no one else wanted. Many of the jobs he did himself. The rest he supervised with the same enthusiasm he shows today.

Before long, he came to the attention of the heads of oil and gas companies for whom he now contracts the big jobs. They liked what they saw in the energetic ingenious Texan and the way he shoveled on the coal to make speed when necessary.

As the defense and war periods overtook the nation, Fulton began contracting pipeline work on major air bases in west Texas and New Mexico. During the 2-year period from 1941 through 1942, he did practically all the pipeline work on 11 air bases. 1943 saw the company's first major project take shape and Fulton in the big time. It was a long big-diameter steel-laying job—the kind that makes every true pipeliner feel that he's finally out of the sandlot class and in the big leagues. In 1944, he landed a 150-mile job in Hansford County, Texas, for Phillips Petroleum Co. In 1945, the firm was called in on a major transcontinental run from the Rangely Oil Fields of Colorado for Standard Oil Co. Then in rapid succession, the company did a 100-mile job near Hastings, Minn., which Standard Oil Co. of Indiana was pushing from Chicago to Fargo, N. Dak. By 1947, the firm was handling 26-inch lines. Today, 30-inch contracts are routine.

In this short span of years, R. H. Fulton & Co. has done some memorable jobs. There was a 200-mile project in North and South Carolina in 1950 where the line dove from rocky hills into swamp. There was a 183-mile job in Tennessee, laid through swampy country in one of the rainiest seasons in years. Another job loaded with difficulties was a 63-mile line through Utah's lofty Wasatch Mountain range. Right now, one of Fulton's spreads is caught in extremely hard rock on top of the Continental Divide.

About 50 per cent of Fulton's time is spent in the field, and the rest is spent in Lubbock and other cities, checking on prospective work. With all his heavy equipment, Fulton could probably move into other contracting fields if pipeline laying should ease off. But this is hardly likely. With the population growing and much of it shifting to the west, gas companies are busy raising money, obtaining FPC permission for expansion, and letting contracts for new lines.

Is Oil Man Too

As if heading a huge pipeline organization weren't enough to keep any man busy, Fulton also entered the oil business. It was something he had wanted to do for a long time. In 1952, gambling with money he had made in the pipeline business,

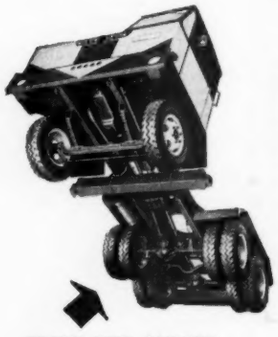
THE PRICE IS THE PAY-OFF IN THE NEW LORAIN MC-104 MOTO-CRANE®

Don't let the low price fool you! Sure, we are talking price . . . *because the new "MC-104" is the lowest priced Moto-Crane you can buy.* But no other crane on rubber approaches the design quality and performance of this new Lorain "baby". Look what you get in this "bargain in quality":

A new 45 m.p.h. Moto-Crane Carrier—An entirely new design developed exclusively as a shovel-crane mounting. Powered by a Ford engine, with 8 forward speeds and 2 reverse speeds, its "6x4" drive delivers power to both rear axles. Ten big 9:00x20 tires provide soft-ground flotation and Equalizer Rocker Beams provide constant ground contact and tractive effort for off-the-road travel. There's a sturdy, all-welded frame, with 15" deep side members, to provide a solid base. Mounted on this sturdy carrier is a turntable design that has "borrowed" many of the time and field-proved Lorain "TL" big machine features. The clutch shaft alone contains 18 anti-friction bearings. The convenient "Packaged Component" design permits quick changing of Hoist Shaft, Clutch Shaft and Engine in complete units. 5 interchangeable booms, matched to "MC-104" design, complete this low-priced, quality package.

Want proof? Phone your nearby Thew-Lorain Distributor. Ask him to demonstrate the "MC-104". He'll show you why . . . you get more in the "104".

The Thew Shovel Co., Lorain, Ohio.



BRAND NEW CARRIER

Newly designed throughout by Thew . . . built by Thew . . . for shovel-crane operation. The kind of "high quality" carrier you would expect from the pioneer builder of rubber-tire cranes. The "MC-104" is available as a 3-axle, "6x4" Carrier, with power on both rear wheels, easy-acting Hydraulic Brakes. Out-rigger boxes and beams optional. Rear fenders removable.

THE NEW "MC-104" SHOVEL BOOM

Powerful, independent, positive cable crowd — 14 ft. boom — 12 ft., 7 in. stick. ⅜-yd. dipper capacity. Rugged, "big machine" construction. Power operated dipper trip.

ONLY LORAIN BUILDS THE MOTO-CRANE

Ask Your Distributor

Fulton started to wildcat on his own and in company with such people as True & Brown of Casper, Wyo. The first ten drilling ventures produced ten dry holes.

"As fast as his pipeline spreads could make money, he'd pour it down those rat holes," grinned one of his superintendents. "But then he hit, and it was his turn to laugh."

No. 11 was lucky and turned out to be a good producer. Looking at the black gold, Fulton was more than repaid for all the previous dry holes and disappointments.

By the end of last year, Fulton and his partners in Casper brought in between 40 and 50 completed and producing oil wells, most of them in Wyoming. In this venture, as in other undertakings, Fulton's behavior was characteristic. He stuck it out when things looked hopeless, then began to increase the tempo of his operations when things began to look good.

Today, Fulton is looking forward to the time when his only son, Joe Kirk, can share the responsibilities of the petroleum enterprise. Joe Kirk, a student at Texas Tech, is studying geology, engineering, and subjects which will help him work into the oil business with his father. As a sideline, Joe Kirk is drilling a wildcat well on his own.

While the senior Fulton is interested in affairs outside of business, is a 32nd Degree Mason, a Shriner, and an active member of Lubbocks' First Baptist Church, the things which mean the most to him are the human contacts and business friendships he has built up over the years. Nothing delights him more than to visit one of his field spreads where he can talk to men in overalls and khakis, or visit cities like Houston, Chicago, Tulsa, or Denver, where key people in the petroleum and gas world are gathered.

As for Fulton's business, it's going to be a force to be reckoned with for a long time in the pipelining industry. At the moment, the firm is engaged in preliminary negotiations toward opening a Canadian office, either in Edmonton or Calgary, Alberta, early this year.

Wherever pipeline work is needed, wherever the big difficult jobs are undertaken, it's a sure bet that R. H. Fulton will be close by with good crews and the finest equipment money can buy. And although profit will be an important factor for his presence, the biggest reason will be because—as Fulton says—"I just flat like it!" THE END

The Fram fuel filtering device

Diesel Fuel Filter

■ A filter said to remove all water from diesel and other fuels is introduced by the Fram Corp., Providence 16, R. I. The Fram water separator and fuel filter enables diesel engine operators in the construction field to stop the replacement of expensive injector parts that results from abrasive action of solid contaminants and the acid corrosive effects of contaminating water.

The device is a combination unit mounted in series consisting of a fuel filter and water separator. Both units use replaceable cartridges. The fuel filter unit removes dirt, rust, and other solid contaminants down to one micron in size while condensing water in the fuel into large droplets. The clean fuel then passes through a connecting nipple into the water separator unit. Water collects on the outside surface of the separator cartridge and drops into the sump. The water is easily removed from the filter sump by a drain valve.

For further information write to the company, or use the Request Card at page 18. Circle No. 3.

Carbide-Tipped Saw Blades

■ An illustrated folder describing its new line of carbide-tipped blades for use with radial saws has been issued by the Delta Power Tool Division of the Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

In addition to pictures and descriptions of the blades themselves, the booklet features captioned inset photos of typical operations for which the new blades are suitable. This includes making difficult compound miter cuts, cutting plywood panels to size, ripping solid stock at speeds up to 90 feet per minute, making intricate cuts in hardwoods, and cutting heavy aluminum channel and plastics.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 35.

Preload Opens New Office

A new regional sales office, at 111 W. Washington St., Chicago, Ill., has been opened by the Preload Construction Corp., New York City. Harold F. Sommerschield has been appointed district manager of the office.

The new district office will represent Preload—builders of prestressed-concrete tanks, silos, and bins—in North and South Dakota, Minnesota, Nebraska, Iowa, Illinois, Missouri, Kansas, Wisconsin, Indiana, and Michigan.

1/2-YD. CLASS — Available with 2 or 3 axle carrier.

3/4-YD. CLASS — Available in 2 lifting capacities.

... and here are the others in the big

LORAIN MOTO-CRANE FAMILY

Five more sizes complete the Lorain line of Moto-Cranes . . . all the way up the to big MC-824 . . . the world's largest crane on rubber tires. Also, many sizes available as single engine, Self-Propelled models. If you need a crane on rubber, look no further than your Thew-Lorain Distributor . . . he has the greatest selection!

HEAVY-DUTY 3/4-YD. CLASS — Additional capacity for longer boom work.

1 TO 3-YD. CLASS — Tops in capacity. The world's largest crane on rubber.

1-YD. CLASS — Still more crane capacity — as "6x6" or "6x4" carriers.

THEW LORAIN.

YOU GET *MORE* IN THE "104"

The Thew Shovel Co.
Lorain, Ohio

Gentlemen: Please send the following:
☐ New "MC-104" Catalog.
☐ Data on other Moto-Crane models as follows:.....

Name.....

Address.....

City.....State.....

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Pay for Work Under Cancelled Contract

THE PROBLEM: *A contract to grade areas called for payment every 15 days on an hourly basis. After repeated delays in payment, the contractor notified the owner that work would be discontinued unless delinquent payments could be made within ten days. They were not made, and the contractor cancelled the contract. Was he entitled to collect for the reasonable value of the work done, as distinguished from the contract price?*

THE ANSWER: Yes. (Spitalny v. Tanner Construction Co., 254 Pac. 2d 440. Arizona Supreme Court.)

The court decided: If the contractor waived delays in payment, the waiver was obviated when he later notified the owner that the payments must be made within ten days.

When, as here, a contractor becomes entitled to be paid the reasonable value of work done, value is measured by benefit to the owner as distinguished from the cost to the contractor.

Public Contracts

THE PROBLEM: *Contrary to statute, a township board hired one of its members to operate a tractor, grader, and truck in making road repairs. (1) Was the employment invalid? (2) Having been paid for the work, should the member be required to refund the payment?*

THE ANSWER: (1) Yes. (2) No. (Polk Township v. Spencer, 259 S. W. 2d 804, decided by the Missouri Supreme Court.)

The court applied the general rule that, regardless of statutory prohibition, it is against public policy for a public officer to place himself in a position where his official duties conflict with his personal interests under a contract with the public agency of which he is an officer.

But where, as in this case, the public agency has received full value for the services and paid for them, the court said the official should not be required to refund. (The courts of some states might reach a contrary decision on this specific point.)

Abutter's Attack on Assessment Defeated

THE PROBLEM: *A preliminary estimate of paving cost was $9.18 per linear foot. The actual cost was $16.325. Plaintiff, an owner of abutting property assessable for the improvement, knew or ought to have known that the cost would considerably exceed the estimate, but made no objection until the work had been completed. Was he entitled to challenge the validity of the assessment?*

THE ANSWER: No. (LaFollette v. City of Fairmont, 76 S. E. 2d 572, decided by the West Virginia Supreme Court of Appeals.)

The court intimated that had it been shown that the discrepancy between estimated and actual costs was more than a reasonable margin for miscalculation, and had it appeared that the plaintiff had no opportunity to keep in touch with the paving as it progressed, he might have been entitled to challenge the assessment.

Damage to Equipment, Liability of Lessee

THE PROBLEM: *Can the lessee of mobile equipment be held liable for injury to it when, due to insufficient blocking, it is moved by a storm that could have been foreseen?*

THE ANSWER: Yes. (Condenser Service & Engineering Co. v. Brunswick Port Authority, 74 S. E. 2d 398, decided by the Georgia Court of Appeals, Division 1.)

The Authority had leased a gantry crane to the corporation's wholly owned corporate subsidiary for use in scrapping a ship. To secure it when not in use, only brakes were applied, although the crane was also equipped with chocks. Wind pushed the crane off the end of the track upon which it rested, into water, rendering it a total loss. The court said that on proof of these facts, the lessee would be liable for the damage.

If the wind was no stronger than might have been expected, the loss must be attributed to negligence rather than to an act of God.

Injury Caused by Defect In Borrowed Scaffold Plank

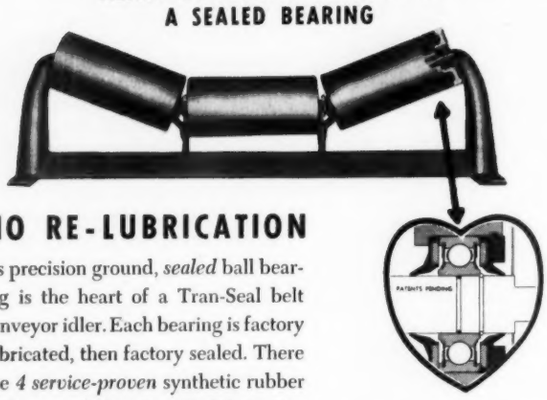
THE PROBLEM: *The superintendent of a general contractor permitted an employee of one subcontractor to choose a plank from a stack of planks left by another subcontractor and use it in scaffolding. The plank chosen was defective, and the employee was injured. Was the general contractor liable?*

THE ANSWER: No. (Glass v. Gens-Jarboe, Inc., 113 N. Y. Supp. 2d 595, decided by the New York Supreme Court, Appellate Division, First Department.)

The court noted that the super-

LIFETIME LUBRICATION for
BELT CONVEYORS

HEART OF TRAN-SEAL IDLER IS A SEALED BEARING



NO RE-LUBRICATION

Its precision ground, *sealed* ball bearing is the heart of a Tran-Seal belt conveyor idler. Each bearing is factory lubricated, then factory sealed. There are *4 service-proven* synthetic rubber seals on each bearing. Re-lubrication is *never needed*. For details, write TRANSALL, INC., 120 N. 11th St., Birmingham, Alabama.

Cross section of bearing showing 4 seals which keep lubrication in and dirt out.

(119-R)

TRANSALL SECTIONAL BELT CONVEYOR SYSTEMS

BURCH is the BEST BUY!

BURCH *Uni-Flow* SPREADER

for Cinders, Calcium, Salt, Sand, and Chips

- Accurate spread control
- Fast and efficient operation
- Low maintenance

Operation is by positive drive direct from truck power take-off. Spread of material is controlled by adjustable baffles. Material can be spread on one side of the unit if desired—or up to 30 ft. wide with baffles fully open.

A roller chain, actuated by the driving shaft, connects with an independent fully enclosed reduction unit for the spinner—so that conveyor and spinner are in proper speed relation at all times. Spinner unit can easily be removed and hopper used for hauling miscellaneous materials.

Standard sizes 5 and 9 cu. yd. Designed for easy and proper mounting on standard motor truck chassis. For literature write today to Dept. CE-34.

The BURCH Corporation
CRESTLINE, OHIO, U.S.A.
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

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FOR:
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789 BERGEN STREET BROOKLYN, N. Y.
• ST 9-4040 •

intendent had not selected the particular plank, and that there was nothing to show that he knew that any of them was defective. The injured man had a better opportunity than the superintendent to dedetermine whether the particular plank was safe.

Rights of Assignees Of Claim Against U. S.

THE PROBLEM: *Under Federal law (31 U. S. C. A., sec. 203) an Army or Navy contract may provide that the contractor's claim against the Government, when assigned, shall not be subject to reduction or set-off for any debt of the contractor, arising independently of the contract. Under such a contract, can the Government, as opposed to an assignee, set off against a balance due the contractor an amount of withholding and unemployment taxes that had been withheld from employees during performance of contract?*

THE ANSWER: No. (Central Bank v. United States, 73 Sup. Ct. 917, decided by the United States Supreme Court, June 1, 1953; reversing a decision of the United States Court of Claims, 105 Fed. Supp. 992.)

Rejecting argument that the statute should be so interpreted as to protect the United States, the court said that it should be so read "as to encourage the private financing of Government contracts".

Interest on Damage Award Was Not Allowed

THE PROBLEM: *A contractor was awarded damages against a California municipality for losses resulting from being delayed in constructing a water-supply line, due to the city's delay in securing rights-of-way. Did the trial judge err in allowing interest on the damage award from the date when the contract was completed to the date of judgment?*

THE ANSWER: Yes. (McGuire & Hester v. City and County of San Francisco, 247 Pac. 2d 934, decided by the California District Court of Appeal, First District.)

The court decided that interest is not allowable in such cases in the absence of statutory provision, and that a California statute authorizing interest on claims for such damages as may be computed with certainty does not apply to claims against municipalities.

Contractor Was Not Liable to Abutters

THE PROBLEM: *An under-river tunnel contractor performed his work according to plans and specifications and without negligence. Was he liable to the owners of an adjacent building whose support was damaged by a dewatering operation?*

THE ANSWER: No. (Tidewater Construction Corp. v. Manly, 75 S. E. 2d 500, decided by the Virginia Supreme Court of Appeals.)

The court cited decisions of the United States Supreme Court and appellate courts of Arkansas, California, New York, and Texas to support the declaration: "A contractor or agent lawfully acting on behalf of a principal to whom the right of eminent domain has been accorded, in making a proposed public improvement, cannot be held personally liable for damages if such improvement is made without negligence on his part."

In a California case, a contractor who built a road across a swamp was exonerated from liability for injury to a water main under the above stated rule of law. (Marin Municipal Water Dist. v. Peninsula Paving Co., 34 Cal. App. 2d 647, 94 Pac. 2d 404.)

And, in a case decided by the Washington Supreme Court, a sewer contractor defeated suit for injury to an adjacent building due to dewatering of an excavation through ground that was marshy and had a high water table. (Muskatell v. Queen City Construction Co., 3 Wash. 2d 200, 100 Pac. 2d 380.)

Model GXTT

MODEL GPX-D — Tandem axle. Drop or flat deck. Cap. 16 through 35 tons.

MODEL PS — Single axle, spring mounted platform or float.

model.
MODEL SP—Jack over axle

YOU'LL SAVE TIME AND EQUIPMENT . . . with A "TRANSPORT TRAILER"

14 thru 22-ton capacities . . .

Gooseneck type tilting platform cargo carrier equipped with two double-acting hydraulic cylinders cushion trailer platform when titled, with or without load. Saves time—saves equipment — one man operation. Exclusive "TRANSPORT" tandem axle assembly gives both lengthwise and crosswise oscillation.

For Added Service . . .

Single or dual axle "TRANSPORT" front dollies convert semis to full trailers easily and quickly.

WRITE FOR COMPLETE INFORMATION

TRANSPORT TT TRAILERS INC.
CEDAR RAPIDS IOWA, U.S.A.

High lift, Big load capacity, Wheeler speed charge hoppers at lower cost

Bin-batching costs drop fast when mixing plants load hoppers with high-lift, long reach, fast-moving MM Wheeler-Loader units.

Loader attachments, built specifically for 30 hp. RTI and 57 hp. UTIL Minneapolis-Moline Wheelers, reach *up* to load the highest hoppers, *out* to fill trucks, cars, conveyors.

With exclusive shuttle speeds and instant reversing, the UTIL combines high rate of travel and hydraulic pump efficiency to make each load-and-dump trip in shortest possible time.

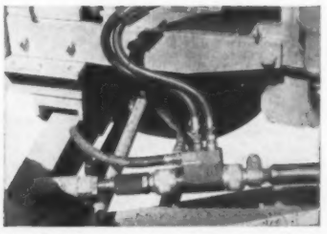
Reserve Wheeler power and greater torque at moderate rpm keeps Wheelers operating in heaviest going. For short, fast maneuvering in congested areas, Minneapolis-Moline offers heavy-duty power steering at lower cost. For any loading job, call in your Minneapolis-Moline dealer-distributor. Let him demonstrate how you can save money by replacing expensive, less maneuverable equipment with lower-cost time-saving Minneapolis-Moline Wheeler units.

MM MINNEAPOLIS MOLINE MODERN MACHINERY

MINNEAPOLIS-MOLINE
Minneapolis 1, Minnesota

Owner of this St. Paul, Minn., mixing plant replaced two loader outfits with this MM Wheeler-Loader unit, loads bins for less.

Wheeler maneuverability plus good bucket control speeds up surface mixing operations. Shuttle gearing spots loads in half the time.



UTIL Wheelers available with hydraulic POWERflow steering for maximum operating ease. Built-in safety features insure constant control.

Elis equipment is used to make these shores.

Standardized Equipment For Adjustable Shores

■ Shoring equipment consisting of clamps, precut lumber, jacks, and shore-head clamps is available from the Elis Equipment Co., Inc., 211 N. W. 4th St., Oklahoma City, Okla. This material eliminates the need for measuring, cutting, splicing, and wedging. An adjustable shore can be made by nailing two clamps to one of the Elis Sticks and then slipping a second piece of the prefabricated lumber through the two clamps. The upper shore member is lifted to the desired height where it remains held by the clamps. The jack is not needed for erecting the shore, but is used for adjusting, leveling, and lifting heavy loads.

All the metal parts may be obtained on a rental basis with purchase option, and a contractor may use his own 4x4's if he prefers. The Elis Sticks are dressed and painted 4x4's available in standard lengths of 5 and 7 feet. They can be used over and over again for shores, joints, joist bearers, nail studs, whalers, purlins, and scaffolds.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 124.

Change Made at Byers

A new corporation, The Byers Mfg. Co., has been formed, taking over the business of The Byers Machine Co., both of Ravenna, Ohio. The switch has entailed no change in management or policy and is solely a transfer of assets to the new corporation. Byers is a manufacturer of cranes and shovels for the construction industry.

Wheel-Mounted Sprayer

■ A wheel-mounted power sprayer for silicone-type waterproofing compounds, whitewash, water-base cement paints, weed killers, and other similar spraying solutions is announced by the Campbell-Hausfeld Co., Harrison, Ohio. The 12-gallon Model 353 Paragon power sprayer is equipped with a brass-cylinder piston-type pump with a specially designed by-pass valve. The pump delivers up to 1½ gpm with adjustable pressures up to 150 pounds.

Power comes from a four-cycle gasoline engine or an electric motor. A double-blade agitator surrounds and cleans the strainer screen at each pump stroke and keeps the solution thoroughly mixed so that it will not clog. The spray gun produces a fine mist or a stream 25 feet high.

The Paragon Model 353 sprayer.

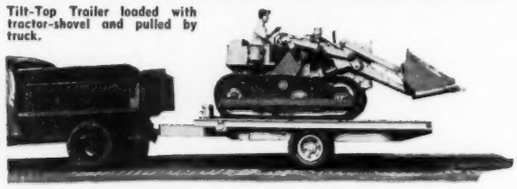
For further information write to the company, or use the Request Card at page 18. Circle No. 10.

BIRMINGHAM TILT TOP TRAILER

SLOW, SMOOTH TILT CONTROLLED BY HYDRAULIC OIL CYLINDER

Tractor-shovel being loaded under its own power, on Tilt-Top Trailer.

Tilt-Top Trailer loaded with tractor-shovel and pulled by truck.



New and Different

Here is a new and different idea in a tilt-top trailer. In loading or unloading, the trailer bed tilts slowly and smoothly because its movement is controlled by an hydraulic oil cylinder. There is no jerk or bounce onto or off the ground.

This new Birmingham Tilt-Top is ideal for contractors who have no truck-tractor or lowbed trailer to use in moving equipment. Tilt-Top is easily operated by one man. To load, pull the safety pin, tilt the bed, drive the load on and replace the safety pin. To unload, pull the safety pin and drive the load off as the bed slowly tilts. Haul the trailer by using a pintle hook on the rear of any truck of 1½ tons or more capacity.

Birmingham Tilt-Top Trailer is economical in price. Write or wire the Factory or our distributors.

Manufacturers of famous Birmingham Lowbed Trailers

BIRMINGHAM MANUFACTURING COMPANY

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Birmingham, Alabama
Cable Address "Birmco"

Every detail of "INFERNO" construction contributes to the outstanding strength, durability and safety of this heavy-duty steam hose. Many a pile-driving record has been made with "INFERNO" on the rig; and it will prove equally efficient and economical in all other steam services.

"INFERNO" specifications include high-temperature tube; multiple-layer, braided steel wire carcass; red wear- and weather-resistant synplastic cover. Sizes ½" to 3", inclusive, in maximum lengths of 50 feet.

Construction of the braided wire carcass permits steam to escape without bursting the hose, should it be severely damaged in service.

Contact Our Nearest Branch for Details and Prices

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Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

Est. 1870

A recent addition to the Lorain Moto-Crane line is the 6-ton Model MC-104 rubber-tire-mounted crane.

Tire-Mounted Crane Is Smallest in Line

■ A new six-ton rubber-tire-mounted crane is announced by the Thew Shovel Co., 28th St. and Fulton Road, Lorain, Ohio. Like other Lorain Moto-Cranes, the new MC-104 is convertible to a shovel, as well as a hoe, clamshell, and dragline. The ⅜-yard unit is a two-engine machine with a separate power source for turntable and carrier. It is the lowest priced of the Lorain Moto-Cranes.

A feature of this model is its new three-axle carrier designed by Thew engineers and built in Thew-Lorain plants. Side frames are 15 inches deep with a massive front bumper and cross bracing built into the frame as a single weldment. The carrier is equipped with a six-cylinder 112-hp Ford motor and has eight forward speeds up to 45 mph and two reverse speeds. Power is applied to both rear axles to provide a 6 x 4 carrier. The rear axles are mounted on rocker beams which permit independent movement of each axle for off-the-road travel over rough terrain. This gives a stable base for shovel-crane operation while also allowing flexibility for road travel. The front axle is spring mounted.

All ten tires are of the large heavy-duty truck type (9:00 x 20), giving good flotation on soft ground. A vacuum booster is provided for the hydraulic brakes on all four rear wheels. Two sets of telescopic outriggers are available, one for installation amidships and one for installation across the rear. Over-all width of the carrier is 96 inches.

The turntable is constructed with features found in the rest of the Lorain TL Series, including interchangeable packaged component design. The engine, clutch shaft, hoist shaft, or cab may be removed as complete units, and new ones may be installed.

A Ford engine, Model 215, with all the accessories, including a gear reducer, is assembled on a single-piece mounting frame that slides in or out of the rear doors of the cab as a complete unit. The engine is mounted at the rear of the one-piece all-welded turntable bed which is fabricated of structural alloy steels. The bed revolves on four hook rollers with adjustable rollers to take horizontal thrusts.

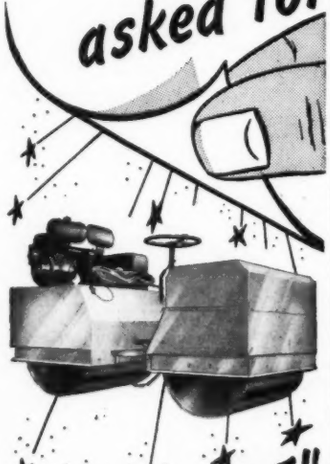
The clutch shaft, mounted just ahead of the engine, is powered by a chain drive from the engine and is equipped with five identical friction shoe clutches. These interchangeable clutches control the transmission and direction of power for all operations of the machine. The hoist shaft unit consists of side frames, shafting, hoist drums, brakes, and controls. Micro-finish surfaces, antifriction bearings, and flame-hardened parts are construction features.

A two-piece, 25-foot butt-flange-connected crane boom is standard equipment. The hoe boom, narrow and of gooseneck design for better visibility, is 14 feet long, has a 5-foot stick, and a ⅜-yard bucket. The bucket, with removable side cutters, will dig a trench 24 inches wide and 13 feet deep. The shovel boom is 14 feet long with a 12-foot 7-inch stick. The dipper trip is power operated.

Extra equipment available includes front-wheel hydraulic brakes, center sections for extending the boom, a precision boom-lowering device, a cable boom stop, a swing brake and hook block, and outrigger boxes and beams.

For further information write to the company, or use the Request Card at page 18. Circle No. 1.

Here's the Power Roller YOU asked for



NEW MODEL "125" MOTOROLLER

56 psi effective compaction

★ WEIGHT RANGE 1500-2400 lbs.

★ 6 H.P. AIRCOOLED ENGINE

★ LOW CENTER OF GRAVITY

★ EXCLUSIVE FEATURES

- Center Poise Steering
- Unequalled Maneuverability
- Absolute Tracking of Rolls

For further information — write

Gabb Special Products

WINDSOR LOCKS, CONN.

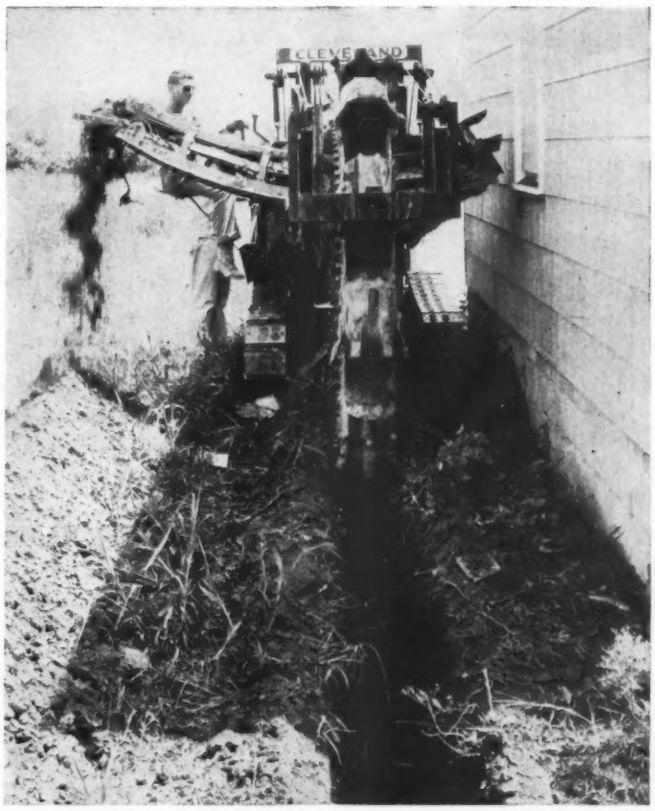
SELF-PRIMING CENTRIFUGAL PUMPS

RICE

Engine belt and electric driven pumps with many new features to give you outstanding performance at low cost. A.G.C. rated. Write for special bulletins.

RICE PUMP & MACHINE CO.

220 N. Park Avenue, Belgium, Wisconsin



20" from Trench to Wall

IN NORFOLK, VA. this Model 92 CLEVELAND "Baby Digger" shows how its useful compactness enables it to place a trench safely within 20" of a house wall. Balanced perfectly on its smooth full crawlers, the 92 maneuvers easily in even the closest quarters, with less damage to lawns, walks and driveways. Because it digs any size of trench from 10 to 20 inches wide and up to 5 feet deep, it is usable on a wide variety of jobs.

The 92 hustles safely from job to job . . . at legal limit speeds . . . because it's so easily portable on the drop-axle, tilt-bed CLEVELAND T5 Trailer.

Write for descriptive literature and specifications or get the full story on CLEVELANDS from your local distributor.

THE CLEVELAND TRENCHER CO.

"Pioneer of the Modern Trencher"

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

This Euclid Model 4FFD, equipped with the Allison Torqmatic brake, is going down a 7 per cent grade.

Torque Device Brakes Downhill Truck Speed

■ A new braking device which can provide positive control over the downhill speed of heavy-duty off-highway trucks without wear on the conventional friction brakes has been announced. The Torqmatic brake is an added unit to the Torqmatic converter now in general use with Torqmatic transmissions in a number of heavy-duty trucks used in the construction industry.

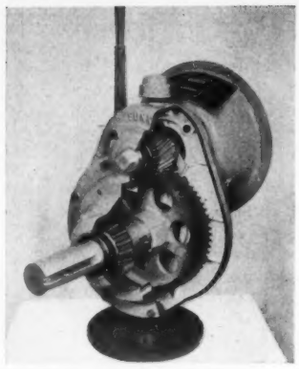
The Torqmatic brake is not a friction-type brake and thus has no parts which burn up or wear out under heavy usage. It consists of three major parts: a rotor assembled as an integral part of the converter output shaft, stator vanes cast into the housing which encloses the rotor, and a control valve.

As the truck moves downhill, the operator opens a control valve which admits oil to the Torqmatic brake. The paddles of the rotor churn the oil against the stator vanes, thus placing a drag on the converter-transmission drive shaft. If more braking is required, more oil is admitted to the brake. Thus the operator has the truck under full control at all times and he need use the conventional friction brakes only to come to a complete stop.

On the downhill grade, the oil does all the braking work and also absorbs the heat generated by the braking action. The pumping action of the rotor circulates the oil to a heat exchanger where the heat is harmlessly dissipated. Source of the oil supply is the lubricating system for the converter and transmission, and after cooling, the oil is returned to the oil reservoir for re-use.

It is pointed out that because it can move downhill under greater control and at higher speed, a truck equipped with the Torqmatic brake can make more trips per shift. In addition, maintenance and replacement of linings on the conventional brakes are greatly reduced.

For further information write to the Allison Division of General Motors Corp., Box 894, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 56.



The Type E Funk gear reduction power takeoff.

Line of Power Takeoffs And Gear Reductions

■ A line of standard direct power takeoffs and gear-reduction power takeoffs built to SAE standard dimensions is offered by the Funk Aircraft Co., 3315 Airport Drive, Coffeyville, Kans. These units are available in four clutch-housing sizes: SAF No. 2 to No. 5.

The direct-power takeoffs have three basic load-capacity-bearing hub and shaft arrangements: extra-heavy side load (C type), heavy side load (B type), and light side load (A type). Gear reductions are made in three basic gear-center sizes: Model F (4 inches), Model G (4¾ inches), and Model E (6½ inches).

The company's Models E and G reductions, said to be the most advanced gear reductions available, feature a straddle-mounted pinion. The pinion gear is installed between two heavy-duty bearings and is driven by a full-floating spline clutch shaft. According to the manufacturer, this feature eliminates the possibility of load deflection, as well as installation misalignment to give uniform tooth contact across the entire width of the gears.

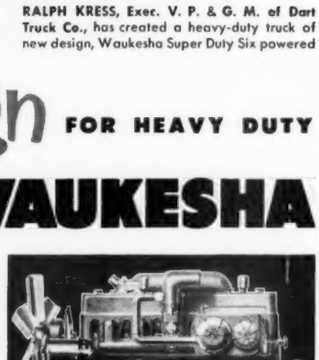
For further information write to the company, or use the Request Card at page 18. Circle No. 85.

RALPH KRESS, Exec. V. P. & G. M. of Dart Truck Co., has created a heavy-duty truck of new design, Waukesha Super Duty Six powered

new design FOR HEAVY DUTY

POWERED BY WAUKESHA

Utilizing the full power of its Waukesha 6-WAKR Butane Engine for driving—the newly designed 30-ton Dart 35-SA End-Dump Truck is most unusual. All auxiliaries, including the cooling system, are driven by a smaller engine . . . a Waukesha 195-GKU. Mounting the engines amidships (centered between the wheels), and the wagon-type front axle, both exclusively Dart, give many advantages. Waukesha power means payload performance plus economy.



☆ Powering this Dart 30-tonner is this 6-WAKR Butane Super Duty Six — 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 290 horsepower at 1800 rpm

Super-Duty Six 1197 CU. IN. 6-WAK Series

- 6-WAK—Gasoline Engine
- ☆ 6-WAKR—Butane Engine
- 6-WAKDB—Diesel Engine
- 6-WAKDBS—Supercharged Diesel Engine

Send for Bulletins

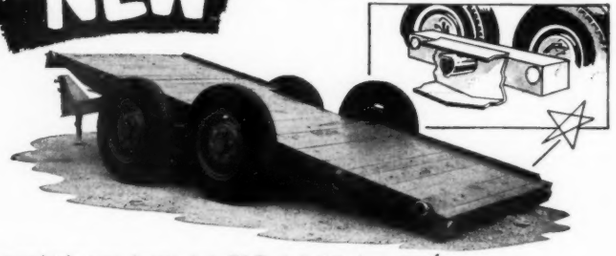
UP TO 352 MAXIMUM HORSEPOWER

Standard or Counterbalanced Crankshafts are available.
Consult Waukesha on permissible speeds for your service.

238

WAUKESHA MOTOR COMPANY • WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

announcing... the NEW all new, tandem axle MILLER 10 Ton Tilt-Top!



A completely new, heavy duty Tilt-Top* designed and built by engineers who pioneered the development of the easier loading Tilt-Top* for hauling heavy equipment.

This new Tilt-Top is massively built from platform's rear edge to the gooseneck at the tongue. Chassis employs a heavy duty version of field proven MILLER tapered side channel design.

And this big Tilt-Top is so precisely balanced that one man can lift it effortlessly for hitching.

Big oak platform (76" x 16') handles rollers up to 10 Tons such big tractors as the D-4 and HD-5. See this NEW Tilt-Top* at your MILLER distributor today

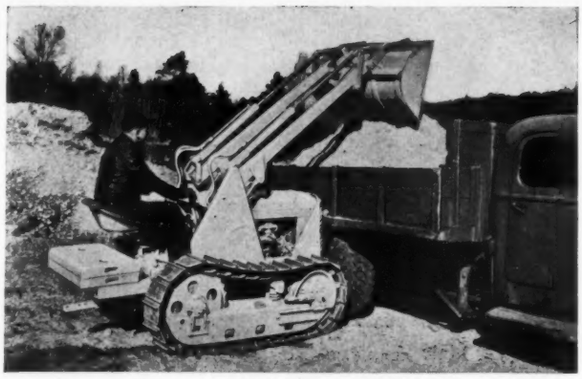
☆ Heavy box section walking beam gives rugged strength and independent wheel action on each side, assuring less jarring and level ride over rough terrain.

Model "BT-10" 10 ton $2100.00* Complete with platform, four 8.25 x 20 x 12 ply tires, heavy duty electric brakes, reflectors, lights and safety chains.

* Plus freight and federal tax

MILLER ® Tilt-Top TRAILERS
research engineers
456 S. 92nd Street, Milwaukee 14, Wis.

MAIL TODAY
Name _____
Company _____
Street _____
Town _____ State _____



A new hydraulic loader is now available for the Oliver Model OC-3 crawler tractor.

Hydraulic Loader Unit For Crawler Tractor

■ A new hydraulic loader unit has recently been announced by the Oliver Corp., 400 W. Madison St., Chicago 6, Ill., for their Model OC-3 industrial crawler tractor. Among the outstanding operational features of the tractor-loader is extreme bucket rotation that permits dumping from ground level to full lift height. The bucket angle in dump position is 75 degrees at ground level and 55 degrees from level at full lift height. The maximum lift height is 10 feet 9 inches, while the loading height at the bucket hinge point is 9 feet 5 inches. With this rotation feature the bucket can be used for digging to a depth of 16 inches below track level as well as for leveling, scraping, and stripping operations. Bucket capacity is ½ cubic yard, and lifting capacity is 2,000 pounds.

Attachments available for the tractor-loader include bulldozer, backfiller, lifting boom, lifting fork, and snowplow. They can be added to the basic loader arms without special tools. The unit can be carried on a light trailer or truck from job to job along with the attachments.

The all-hydraulic operation of the loader is an advantage when down pressure is needed. The manufacturer reports that in loading operations, down pressure gives deep penetration of the bucket with a break-out action equal to three times the lifting power of the loader. The bucket level is maintained when lifting a load, and the bucket rollback prevents wasteful spillage.

A neater appearance has been accomplished by eliminating a great percentage of outside hydraulic hose. A special hydraulic manifold, which runs between the upright supports, houses many of the pressure lines formerly running to the cylinders and valve controls. The new manifold design permits convenient location of the loader controls and allows the operator an unobstructed view of all work.

For further information write to the company, or use the Request Card at page 18. Circle No. 4.

Red Replaces Yellow On Conn. Stop Signs

The color scheme along Connecticut state highways is being changed. The yellow stop signs with black lettering are being replaced by reflectorized red signs with white lettering. Experimental installations have already been made at several intersections.

Eleven other states have experimented with the same type red sign. They report a favorable reception by the traveling public. The new signs are visible from a greater distance and stand out in a group.

An American Automobile Association survey showed only one driver in five obeys the yellow stop sign, while red signs cause 50 per cent of the vehicle operators to come to a full stop.

Republic Rubber Manager

The new manager of distributor sales for the Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio, is James M. Hughes. In his new position, Mr. Hughes will assist Republic distributors and will continue to direct advertising, sales, and sales training.

KEEP HYDRAULIC OIL CLEAN WITH MARVEL SYNCLINAL FILTERS

75% OF ALL HYDRAULIC TROUBLES ARE CAUSED BY DIRTY OIL!

EUCLID 22 TON MODEL TD FEATURING HYDRAULIC BOOSTER STEERING. Marvel Synclinal Filters are installed in sump as standard equipment to protect the entire hydraulic system. (Photo Courtesy Euclid Road Machinery Co., Cleveland, Ohio.)

Users of hydraulic equipment show an ever increasing preference for Marvel Synclinal Filters to maintain the cleanliness of hydraulic oils to the greatest possible degree.

Over 400 Original Equipment Manufacturers have also recognized the superiority of Marvel Synclinal Filters for this purpose and install them as standard equipment.

Installation of Marvel Synclincal Filters either in sump or on line at suction side of pump stops most of the damaging particles at their source.

For Dependable Protection on all Hydraulic and Other Low Pressure Circulating Systems . . . Investigate MARVEL SYNCLINAL FILTERS.

SUMP TYPE (cutaway)

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 g.p.m. Choice of monel mesh sizes ranging from coarse 30 to very fine 200.

IMMEDIATE DELIVERY

Marvel not only delivers a top grade filter in both quality and performance, but delivers IMMEDIATELY. If desired, shipments are made the same day orders are received.

EASY MAINTENANCE

Marvel Synclinal Filters, both sump and line types, may be disassembled, cleaned and reassembled by any workman in a matter of minutes. Line type may be serviced without disturbing pipe connections.

LINE TYPE (cutaway)

WATER FILTERS — In response to the great demand, we have adapted both our sump and line type models for use in all water filtering applications. No changes have been made in the basic synclinal design.

MARVEL ENGINEERING COMPANY
625 W. Jackson Blvd., Chicago 6, Illinois
Phone: Franklin 2-4431

MARVEL ENGINEERING COMPANY CE-3
625 W. Jackson Blvd., Chicago 6, Ill.

Without obligation, please send me complete data on Marvel Synclinal Filters as follows:

Catalog #106 for Oil Filters
Catalog #300 for Water Filters

Name .....
Company .....
Address .....
City ..... State .....

ROAD BUILDERS — IT'S SENSATIONAL!

DRAGS PECKERWOOD DRAGS

STEEL SPRING WIRE ROAD BROOMS
MADE IN ANY C-O-N-T-I-N-U-O-U-S LENGTH UP TO 12 FEET
WIDTH 6 INCHES—IT'S DIFFERENT
ASSEMBLE YOUR OWN—IN ANY SHAPE REQUIRED—IN MINUTES, NOT HOURS

NO FRAME REQUIRED

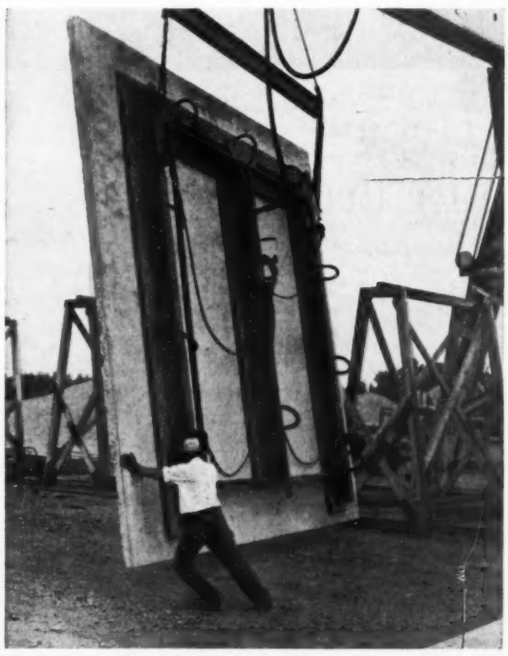
MADE WITH KILN DRIED 6" WIDE HARDWOOD AND HEAVY SPRING STEEL WIRES TRIPLE OUT EACH HOLE. NOT STAPLE SET.

THIS IS IT! ORDER NOW

ILLUSTRATION OF 10-FOOT LENGTH
ONLY $3.50

RUNNING FOOT F.O.B. KC., MO.
NOTICE! Our 15" length Unit Drag 3" wide with the two bolts that fits your frame, still $2.50 ea.

SINCE VAN BRUSH MFG. CO. 1928
327 S. WEST BLVD., KANSAS CITY 8, MO.



Contractor: Concrete Casting Co., Kansas City, Mo.

MAGIC CARPET
FOR CONCRETE HANDLING—
THE VACUUM LIFTER

No inserts or strongbacks to adjust . . . a turned valve does the work. Harnessed atmospheric pressure provides temporary reinforcement—eliminates point stresses and the need for additional steel.

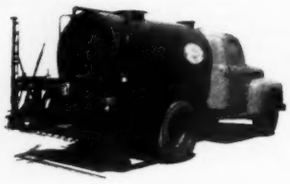
EARLY STRIPPING — EARLY ERECTION

VACUUM CONCRETE, INC.
4210 Sansom Street, Philadelphia, Pa.

New Cartwright Distributor Bars Give Balanced Pressure With No Drip

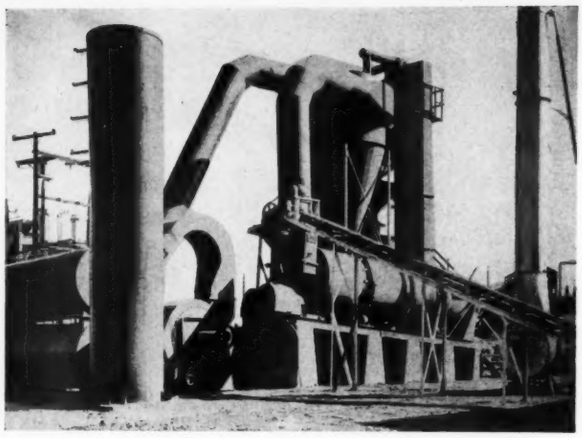
SD Model at right has been designed particularly for city use and to meet a limited budget without sacrificing performance.

Shown at left is a 1250-gallon Precision Distributor. Write for bulletin describing this most advanced equipment and the new Cartwright Circulating No Drip balanced pressure spray bars.



CARTWRIGHT INDUSTRIES

P. O. Box 3251, South Highlands Sta. • Birmingham 5, Alabama



The Standard Steel wet-washing system (shown at left) for this asphalt plant includes two horizontal and one vertical scrubber.

Wet-Washing System For Asphalt Plants

■ A wet-washing system for the removal of dust normally exhausted into the atmosphere by asphalt plants is offered by the Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles, Calif. This compact unit, designed for use with all asphalt plants, is installed on the exhaust side of any existing blower or fan. It is complete with horizontal spray chambers, vertical scrubber, duct work from the fan, and manifolded spray chambers.

The manufacturer reports that the new Standard wet-washing system meets the stringent air pollution requirements of the State of New Jersey and such cities as Los Angeles, Calif. The amount of water required is small, thereby reducing to a minimum the cost and consumption in areas where water supplies are at a premium.

For further information write to the company, or use the Request Card at page 18. Circle No. 33.

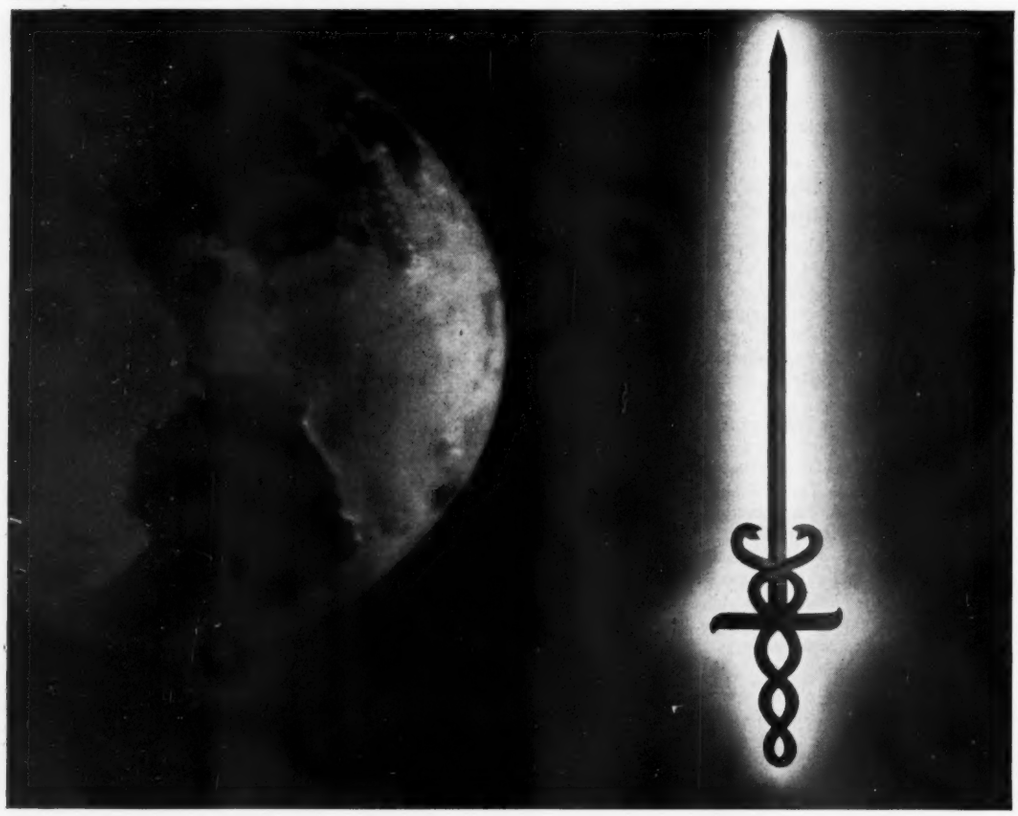
First President Retires, Other Hercules Changes

The first president and former chairman of the board of directors, Russell H. Dunham, has retired from active service with the Hercules Powder Co., Wilmington 99, Del. He has been with the firm for 51 years.

Mr. Dunham, who will remain a member of the company's board of directors and finance committee, took office as president of Hercules in October, 1912, when it was incorporated.

Another long-time employee, Philip F. Powelson, has retired after 41 years with the company.

Raymond C. Hearon has been named plant engineer at the firm's Burlington, N. J., plant, replacing Barrett H. Champion. Mr. Champion has been added to the engineering staff at the home office in Wilmington.



Why the Sword of Hope is Mightier than Ever . . .

IN HIS AGELESS STRUGGLE on a cold and hostile planet, man's most faithful weapon—sometimes his only one—has been Hope; and it has never altogether failed him.

Even today, in the battle against one of our strongest and cruelest enemies—cancer—there are splendid indications that our hope and faith are not misguided; that the long winter of despair is no longer quite so cold nor quite so dark.

Already, cancer patients are being cured—completely cured—who, even five years ago, would have been beyond all help.

Tens of thousands are living happily this Springtime—and will live through many Springtimes yet to come—because they were *saved* last year from cancer.

Other tens of thousands *could* have been saved by today's knowledge, if only they had been treated *in time*.

Why weren't they treated in time—?

Because of all of us. We haven't worked hard enough at cancer education and service to patients. *And we still haven't given enough money* for training physicians, for clinics, and for research.

Yes, The Sword of Hope—symbol of the American Cancer Society's struggle against a mighty implacable enemy—is stronger and sharper than ever. If it isn't being wielded as powerfully as it might be, it's simply because more help is needed from *everyone*. Much more! Won't you please give *really generously*, this year—?

American Cancer Society

Cancer
Man's cruelest enemy
strike back

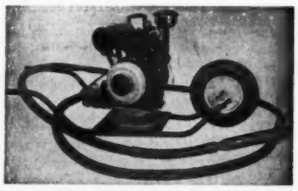
Give

GENTLEMEN:
☐ Please send me free information on cancer.
☐ Enclosed is my contribution of $..... to the cancer crusade.

Name.....
Address.....
City.....State.....

Simply address the envelope:
CANCER c/o Postmaster, Name of Your Town

ROETH



CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
ROETH VIBRATOR CO.
9229 Chestnut Ave., Franklin Park, Ill.

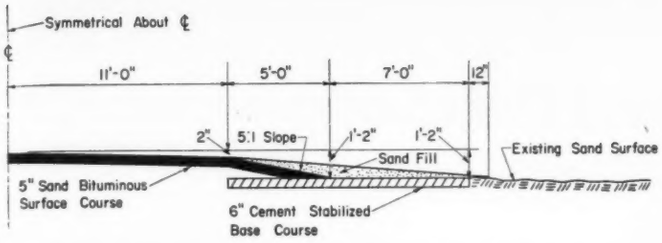


Diagram (above) illustrates shoulder design for checking erosion. At right, the completed pavement and stabilized shoulders blend into the flat coastal terrain.

Ocean Road Strengthened to Resist Erosion

By T. V. FAHNESTOCK, Bituminous Engineer,
North Carolina State Highway and Public Works Commission

Sections of the 48-mile Outer Banks highway are protected against undermining action of waves by soil-cement shoulders

WHEN GALES BLOW off the Outer Banks of North Carolina, waters from the Atlantic Ocean often flood low sections of this slender chain of sandy islands, sometimes undermining road areas in the vicinity of Cape Hatteras and Kitty Hawk. To prevent this potential erosion, the North Carolina Highway and Public Works Commission turned to soil-cement stabilization beneath sections of the 48-mile bituminous section built on the Outer Banks during 1952 (see "New Road to Develop a Remote Barrier Reef", C. & E., Nov., 1952, pg. 82). To date, there has been no erosion of the soil-cement.

At one point, on the west, or Pamlico Sound side, of the Outer Banks, the action of the waves has washed the sand away, leaving a short section of the soil-cement shoulder exposed. At this point, however, the shoulder is built about a foot above natural ground level. Undermining has been prevented with the protection which soil-cement has afforded to the edge of the pavement. And at the present time, sand has been replaced along the exposed shoulder by state maintenance forces.

Altogether, there are approximately 10,400 square yards of soil-cement in the subbase stabilized shoulder. The shoulder is 6 inches deep and 12 feet wide, and the portland-cement factor is 14 per cent. Soil-cement was mixed in a Woods Roadmixer, which utilized salt water from Pamlico Sound in the mixing process. After being compacted with Tampo rubber-tire rollers, the soil cement was cured by covering it with wet sand. The bituminous paving, sloped 5 feet over the stabilized shoulder, was rolled down directly on the soil-cement surface. Where there was danger of damage from wave action, the road grade was lowered to merge with the terrain. Providing additional protection against erosion was a backfill of beach sand, which was brought up over the shoulder to the edge of the pavement.

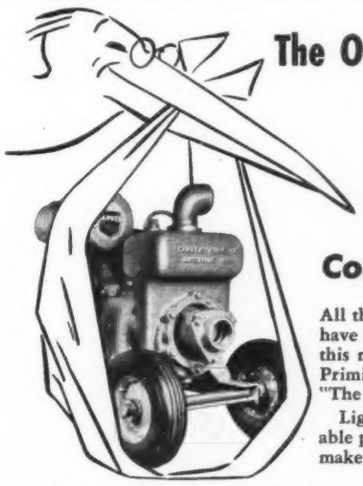
Until the present time, there has been no erosion of the soil-cement shoulder, although water sometimes stands pooled alongside the road in various places after it has flowed over the pavement, and driftwood and other debris along the pavement edges give testimony of the rough action of the water along the seaboard highway. The road contract was completed by Ballenger Paving Co., Greenville, S. C., with H. B. Midgette inspector on the job during construction and E. H. Baggs, resident engineer. THE END

JACKSON BARROWS

The superior design and construction of the Jackson line of heavy duty wheelbarrows stand out under the grueling test of construction conditions. Jackson, first choice of contractors, features built-in durability such as double-folded corners; seamless, press-formed trays; lifetime, oil-impregnated, powdered-metal bearings. To take advantages of lower price, longer wear, better performance . . . buy Jackson!

Jackson MANUFACTURING COMPANY
HARRISBURG, PENNA.

Oldest and largest wheelbarrow maker in America



The Outstanding Arrival of the Year
NEW CARVER
Contractor Pumps

All the important features contractors have wanted for years are built into this new great line of CARVER Self-Priming Pumps . . . truly in every way "The Contractor's Pump."

Lightning fast prime, really dependable performance and easy portability make them the standouts in the field.

Carver makes them all: 4000 G.P.H. to 250,000 G.P.H. Also diaphragm pumps.
See your CARVER DISTRIBUTOR.

CARVER PUMP CO., 1404 Hershey Ave., Muscatine, Ia.

CARVER
the quality name in pumps

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An advertising inch in the Trading Post is measured ⅛-inch vertically on one column. Space reservations close in the New York office on the 10th of the month preceding publication. Send your classified copy to:

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SAVE up to 25% on your DECALS
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FOR PRICES SEND ROUGH PENCIL SKETCH OF DECAL YOU ARE NOW USING
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Bucyrus 2-1/3 yd. shovel front att., 32B-55B.
N. Y. Smith Co., 828 N. B'way, Milw. 2, Wis.

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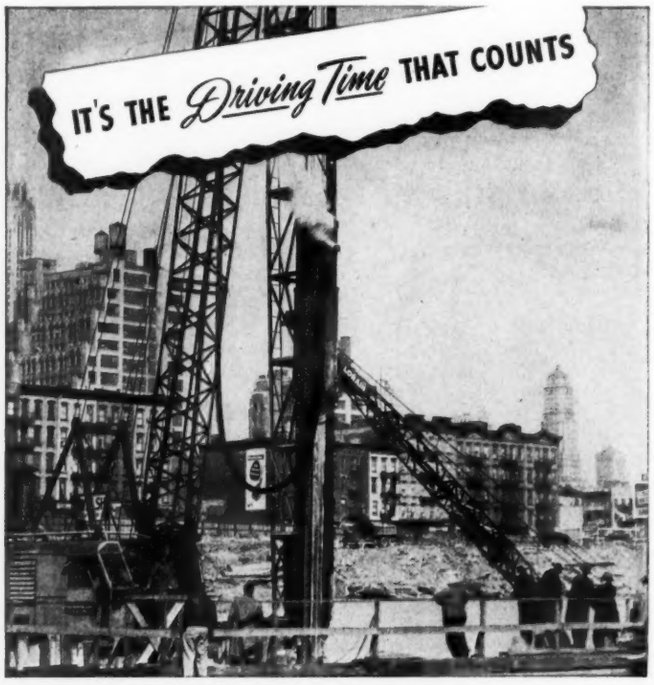

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When pile driving hose "strips" its tube and clogs the hammer-head, the driving operation grinds to a stop. You can prevent these costly shut-downs with Continental's Pile Driving Hose. The tube is "locked" to the carcass. You just can't pull it loose without tearing the hose to pieces. Continental's Pile Driving Hose is an 8-ply, heavy-duty workhorse that *stays* on the job . . . and helps protect your profit.

* * * *

Equip your rigs *now* with Continental's Pile Driving Hose.

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To get "right-away" service, call the nearest Continental branch listed below. These warehouses carry large stocks of hose, couplings, boots, clothing and gloves. Get acquainted *now* with prompt, dependable Continental Warehouse Service.

Rubber by **CONTINENTAL RUBBER WORKS**

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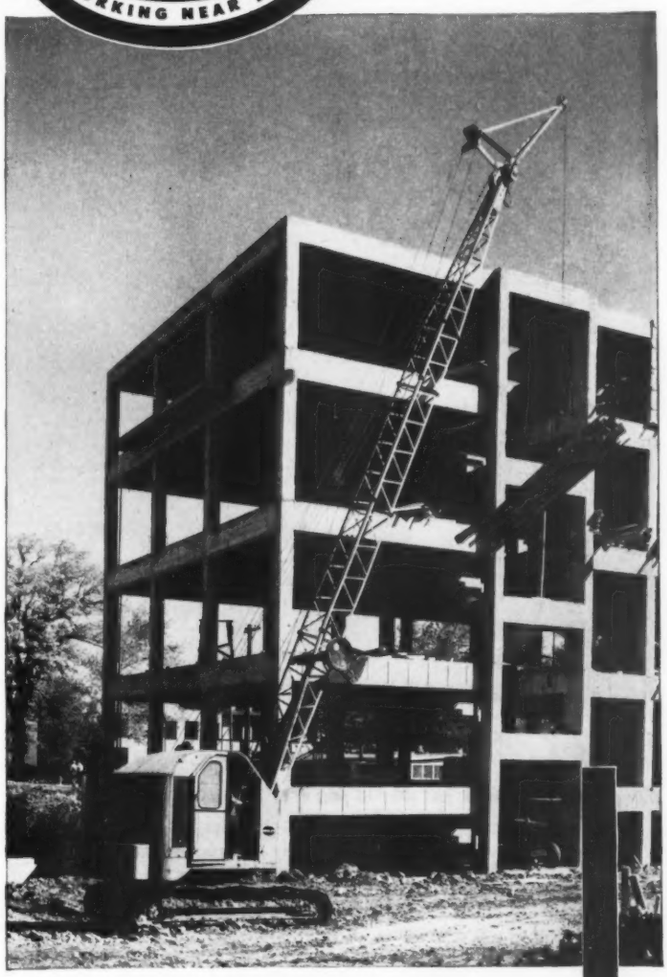
THERE'S AN INSLEY WORKING NEAR YOU

ON A CONSTRUCTION PROJECT



The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted — gasoline, diesel or electric powered. There's an Insley working near you on a construction project.

INSLEY MANUFACTURING CORP. · INDIANAPOLIS
wholly owned subsidiary
THE MAXI CORPORATION, LOS ANGELES

Manufacturer Memos

Managers at Carboloy

The following personnel changes have been announced by the Carboloy Department of the General Electric Co., Detroit 32, Mich.:

Alfred M. Thomson, Jr., has been named manager of east-central district sales, with headquarters in Cleveland, Ohio. He succeeds William S. Baker, now manager of tool sales in Detroit.

J. D. Kennedy has been made manager of the newly created south-central sales district, with headquarters in St. Louis., Mo. Manager of the original New England sales district is Harry H. Jason. He will make his headquarters in Wellesley, Mass. C. W. Powell is manager of the recently established Allegheny district, with headquarters in Pittsburgh.

Appointments at Amsco

The American Manganese Steel Division of the American Brake Shoe Co., 230 Park Ave., New York 17, N. Y., has appointed John Brandenburg as vice president in charge of sales; William E. Crocombe, Jr., as central sales manager, and John H. Baker as district sales manager.

GM Diesel Division News

Several changes in the field sales and service organization of the Detroit Diesel Engine Division of the General Motors Corp., Detroit, Mich., have recently been announced by the company.

Bart W. Patrick, formerly sales representative in the northwest zone, has been moved to the New England zone in the same capacity, replacing Leslie Southgate. Mr. Southgate will assume a new assignment in the industrial sales department in Detroit. The former service representative in the northwest zone, J. T. Hanna, has become the sales representative in the zone. Harold J. Vaughn has been moved from the service training department in Detroit to the post vacated by Mr. Hanna.

W. E. Hendricks of the LeTourneau-Westinghouse Co.

LeTourneau-Westinghouse Names Two for Sales

W. E. Hendricks, who has served as assistant to the general sales manager for the LeTourneau-Westinghouse Co., Peoria, Ill., since last June, has been named domestic sales manager. He succeeds H. R. Powers, who has resigned.

When he joined LeTourneau-Westinghouse, Mr. Hendricks was in charge of government sales. Another promotion elevates Lloyd Rager to the post of sales promotion manager.

New Engineer for Marlow

Making his headquarters in the Sacramento area is William E. Galland, the new northern California district engineer for Marlow Pumps, Ridgewood, N. J., manufacturer of self-priming centrifugal pumps. Like all Marlow district engineers, Mr. Galland recently finished a six-month intensive training course at the Marlow plant.

Richard H. Olson has been made assistant export manager for the company. He will not take over any territory but will aid dealers and distributors on a world-wide basis. Prior to joining Marlow, Mr. Olson was co-owner of J. P. Harris Pump Co.

Four Wheel Drive News

Philip A. Larnino has been appointed manager of manufacturing of The Four Wheel Drive Auto Co., Clintonville, Wis. The appointment completes the reorganization of the executive staff of the company, a manufacturer of four and six-wheel drive trucks.

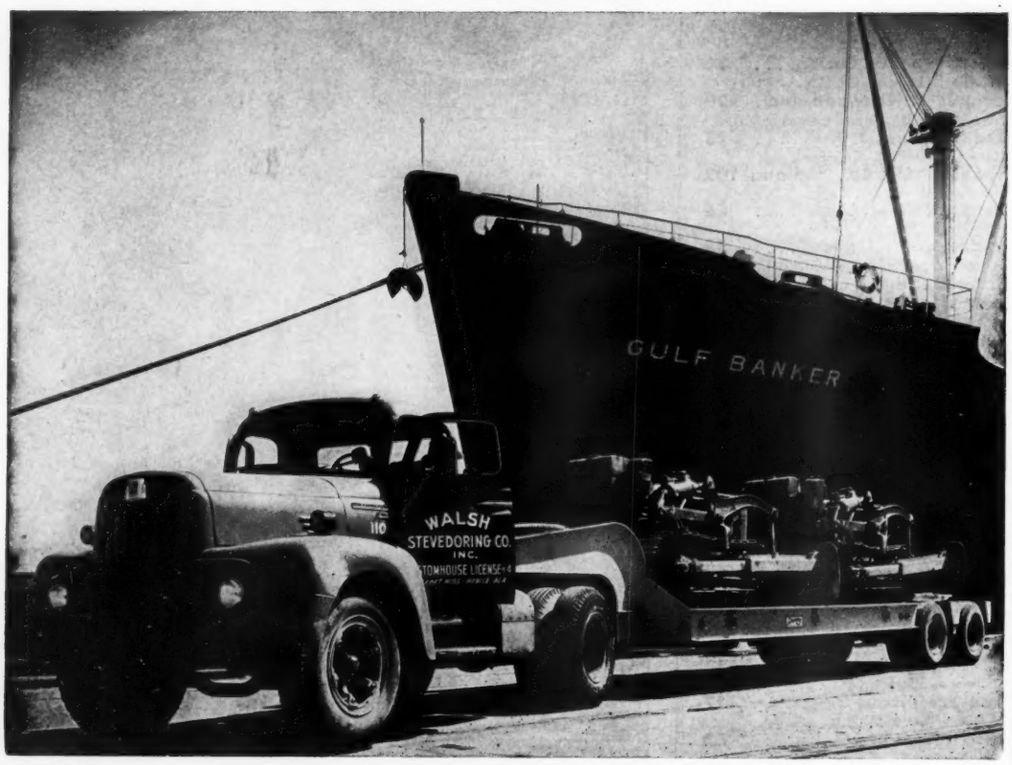
Mr. Larnino comes to the firm with 22 years of experience in manufacturing methods and management. He is the former general manager of the Unicel & Jahn Trailer Division of the Pressed Steel Car Co., Chicago, Ill.

Charles Almy Dies At 65

Charles Almy, co-founder of the Dewey & Almy Chemical Co., Cambridge 40, Mass., died recently in the Massachusetts General Hospital at the age of 65. He had been ill since the beginning of the year.

For the last five years, Mr. Almy, who retired at the end of 1953, had been a consultant to the firm he helped found in 1919. He resigned as executive vice president in 1948. Born in Cambridge, Mr. Almy was graduated from M. I. T. in 1910 with a degree in chemical engineering.

VERSATILE and RUGGED...the Dependable DORSEY MODEL MTS



The varied routine of stevedoring imposes loads of unusual bulkiness as well as weight, but in all situations Walsh Stevedoring Company of Mobile finds Dorsey Low Bed highly maneuverable, fast and reliable. Walsh uses the trailer to move bulldozers, cranes, lift trucks ,etc., from dock-to-dock and port-to-port.

"It takes expert operators for this kind of job and they really put hauling equipment through its paces. Our men like the way a Dorsey handles and it never gives a bit of trouble," says Shop Supt. William Brady.

In construction as well as stevedoring "time lost is money lost"—and Dorsey Heavy Duty Trailers are saving time on hundreds of jobs all over the world.

Dorseys are designed for easy hauling and engineered to provide an extra margin of strength under unusual strain. Beam strength and tire capacity are conservatively rated, for safe hauling and extra-long service.

See your Dorsey Distributor or wire us collect—our engineers are at your service.

DORSEY TRAILERS

DORSEY TRAILERS • ELBA, ALABAMA

THERE'S A DORSEY HEAVY-DUTY TRAILER FOR EVERY NEED

Capacities up to 75,000 pounds. Loads easily, travels swiftly.

Easy to load and to handle. For fast, economical service.

10 or 15 ton capacities. Level or drop decks. Semi or full trailers.

35 to 75 ton capacities, with up to 100 tons on special order.

Henry H. Howard, new vice president of Caterpillar Tractor Co.

Howard Is Vice President Of Caterpillar Tractor

The newly elected vice president of Caterpillar Tractor Co., Peoria, Ill., is Henry H. Howard. He will be responsible for the administration of the company's engine division. Most of Mr. Howard's 27 years with Caterpillar have been in the sales management field. From 1949 to 1953, he was director of sales. Prior to his election as vice president, Mr. Howard was manager of the engine division.

Retires From Pioneer

After serving 25 years with Pioneer Engineering Works, Inc., Minneapolis, Minn., Joe Hanratty, consultant for Government sales, has retired. While Mr. Hanratty's activities at Pioneer were principally in the sales field, he designed the first completely portable washing plant. His design for the construction of a plant which incorporated the return cycle system contributed to the increase in speed and efficiency in the aggregates-producing field.

During World War II, Mr. Hanratty, then manager of Pioneer's Washington office, also assisted in the design of Government rock plants.

Baker Appoints Two

Bert M. Constant has been appointed assistant sales manager of The Baker Mfg. Co., Springfield, Ill., replacing George D. Phares, who has been appointed works manager of Baker's new Beardstown, Ill., plant.

Mr. Constant, who has been with the company since 1941, will also be in charge of advertising. The plant which Mr. Phares will manage will concentrate on the manufacture of Baker snowplows and emergency bulldozers, grade-builders, and other earth-moving equipment parts to augment the Springfield plant production.

Hose Expansion Promotions

As part of its expansion program, the Hose Accessories Co., Philadelphia 32, Pa., manufacturer of air and hose couplings and other accessories, has announced two promotions. A. T. Dewees, formerly sales manager of the Le-Hi Division, has been appointed sales promotion manager for both the Le-Hi and Champ divisions. Fred Starr has been named general sales manager for all products manufactured by the two divisions.

Hewitt-Robins Promotions

The rubber and conveyors divisions of Hewitt-Robins, Inc., Stamford, Conn., now has a general sales manager, F. L. Griffith, Jr. Filling another newly created post, manager of operations for the industrial rubber division in Buffalo, N. Y., is F. W. Blanchard.

Mr. Griffith, who joined Hewitt-Robins in 1949, has served in the Buffalo and Passaic, N. J., plants. A member of the firm for 18 years, Mr. Blanchard gained recognition during World War II as the inventor of an improved process for manufacturing fuel cells.

Vibro-Plus Promotion

Vibro-Plus Products, Inc., Woodside, N. Y., manufacturer of construction and industrial vibratory equipment, has promoted Tage Jonsson to the posts of vice president and general manager of the organization. Mr. Jonsson, who has been with the firm since 1949, has been serving until now as assistant manager.

Elect Atlas Vice President

Elected vice president in charge of the Atlas Powder Co. explosive, industrial finishes, and engineering departments is D. J. C. Copps, a member of the Wilmington, Del., firm since 1929. His successor on the company's board of directors and executive committee, posts to which Mr. Copps had been elected last June, is W. Clayton Lytle, who has been with the Atlas organization since 1917.

Dowd Is Carver Consultant

One of the outstanding authorities on centrifugal pump design, manufacture, and application, William Dowd, is now a consultant for the Carver Pump Co., Muscatine, Iowa. Mr. Dowd became chief engineer and vice president of the Dayton-Dowd Co., Quincy, Ill., in 1917. Since the sale of the company, he has continued as a consultant in the pump field.

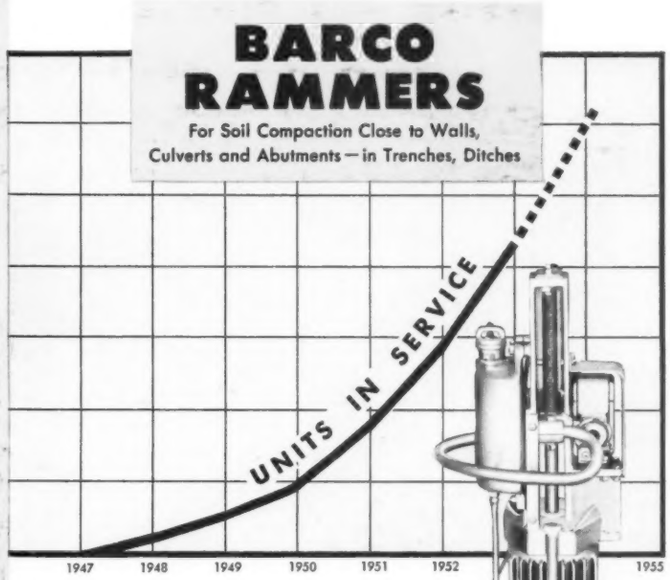
Twin Disc Elects Adamson

N. F. Adamson, vice president of sales of the Twin Disc Clutch Co., Racine, Wis., has been elected to the firm's board of directors. He succeeds the late Grover C. Weyland. Mr. Adamson has been a member of the company since 1925.

TO MEET MOUNTING DEMAND FOR EFFECTIVE SOIL COMPACTION

BARCO RAMMERS

For Soil Compaction Close to Walls, Culverts and Abutments — in Trenches, Ditches

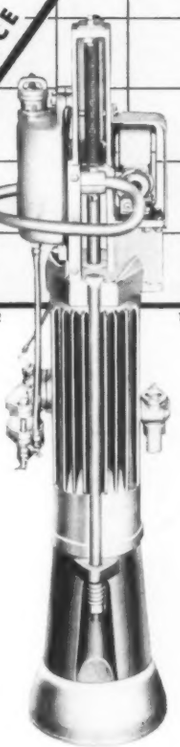


These cylinder bodies are being used in early 1954 shipments of BARCO RAMMERS. All machining, assembling, and testing of Rammers is handled in Barco's new Barrington, Illinois, plant shown below.

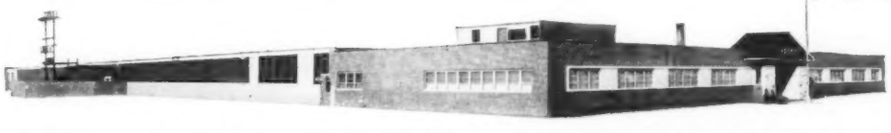
NO RECENT TREND in construction engineering has had a more phenomenal growth than the specification of HIGH DEGREE SOIL COMPACTION for all kinds of projects — Atomic Energy, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Airports, Bridges, Buildings, and Housing Developments!

The key to high degree compaction is the BARCO RAMMER — the first choice of experienced contractors everywhere. In test after test, the Barco machine delivers 95% to 97% compaction EASILY, EFFICIENTLY, ECONOMICALLY.

To meet the demand for Rammers, Barco has steadily boosted production schedules in a new and ultramodern plant. You are assured QUICK DELIVERY in 1954. *Send for latest technical bulletin on Soil Compaction and Barco Rammers.* BARCO MANUFACTURING COMPANY, 518D Hough Street, Barrington, Illinois.



- SELF-CONTAINED
- PORTABLE
- ONE MAN OPERATION
- FASTER COMPACTION
- BETTER COMPACTION
- LOWER INITIAL COST
- LOW OPERATING COST
- EASY TO USE, SAFE!

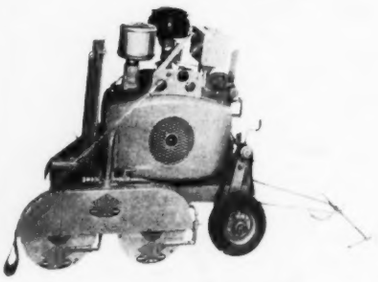


NOW! QUICK DELIVERY FROM FACTORY STOCK!

CUTCRETE

Trail Blade CONCRETE SAWS

BY THE ORIGINATOR OF MOBILE CONCRETE SAWS — HURST LEWIS

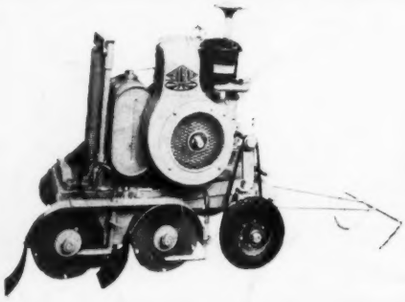


MODEL
SUPER S-T-T

A heavy-duty step cutting, 26 h.p. engine machine with 12" blade capacity, 4" depth cutting at twice speed of single blade machine.

MODEL
J-T

A single blade 8 h.p. engine, light machine for small sawing jobs.

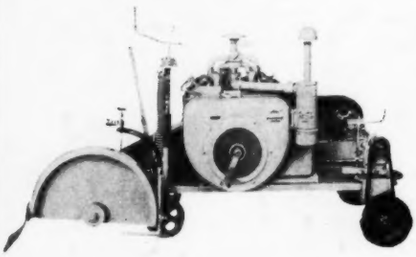


MODEL
S-T-T

Standard 14 h.p. economical step-cutting machine, 10" blade capacity with a 3" depth cutting at twice speed of single blade machine.

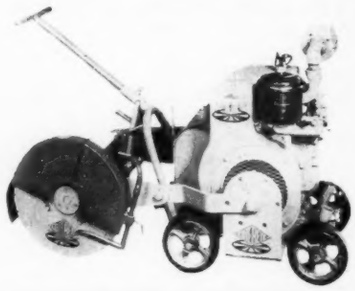
MODEL
AP

Equipped with 8 h.p. engine. The all-purpose saw, 180° adjustable arc. Saws overhead in either direction, flip-over blade for sawing into all corners, 12" blade capacity, 4" depth sawing.



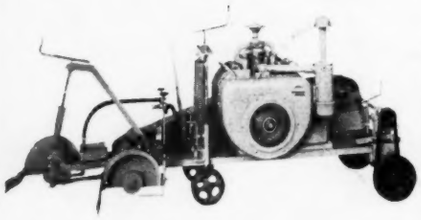
MODEL
S-T-S SINGLE

Heavy-duty single blade, 25 h.p. engine, 24" blade capacity, 10" depth sawing. Used on bridges and industrial flooring where a sharp, clean faced cut is required.



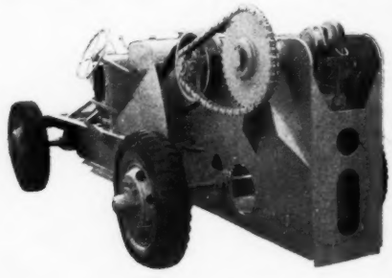
MODEL
APHD

Equipped with 14 h.p. engine, the heavy-duty all-purpose saw. 180° adjustable arc, saws overhead in either direction, flip-over blade for sawing into all corners, 18" blade capacity with 7" depth sawing.



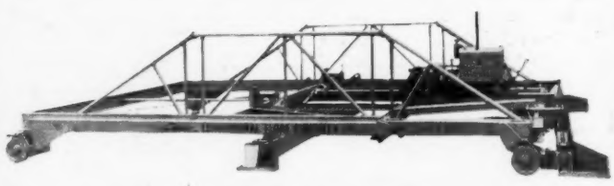
MODEL
S-T-S DUAL

A 36 h.p. engine, dual blades trailed for trench cutting, will cut widths from 1" to 5 feet with a depth of 4". 14" blade capacity, 5" cut.



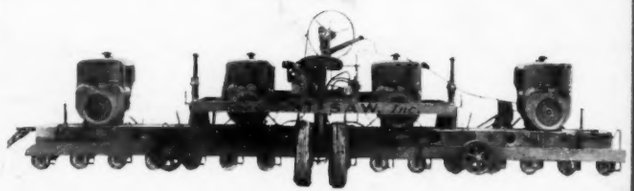
MODEL
1000 BREAKER

A non-pneumatic breaker driving a 1000 lb. weight at 60 strokes per minute at 18" drive. Breaking capacity 10". Interchangeable tamping, cutting and breaking heads.



LEWIS LONGITUDINAL FLOAT FINISHER

A 25-foot wheelbase concrete float finisher with rear screed suspended midway between the two axles.



THE JOINT SAW

A multiple-blade concrete saw for sawing weakened plane joints in highway and airport runways, aprons and taxiways, 8, 12, 16 blades in tandem, widths from 10 to 25 feet.

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